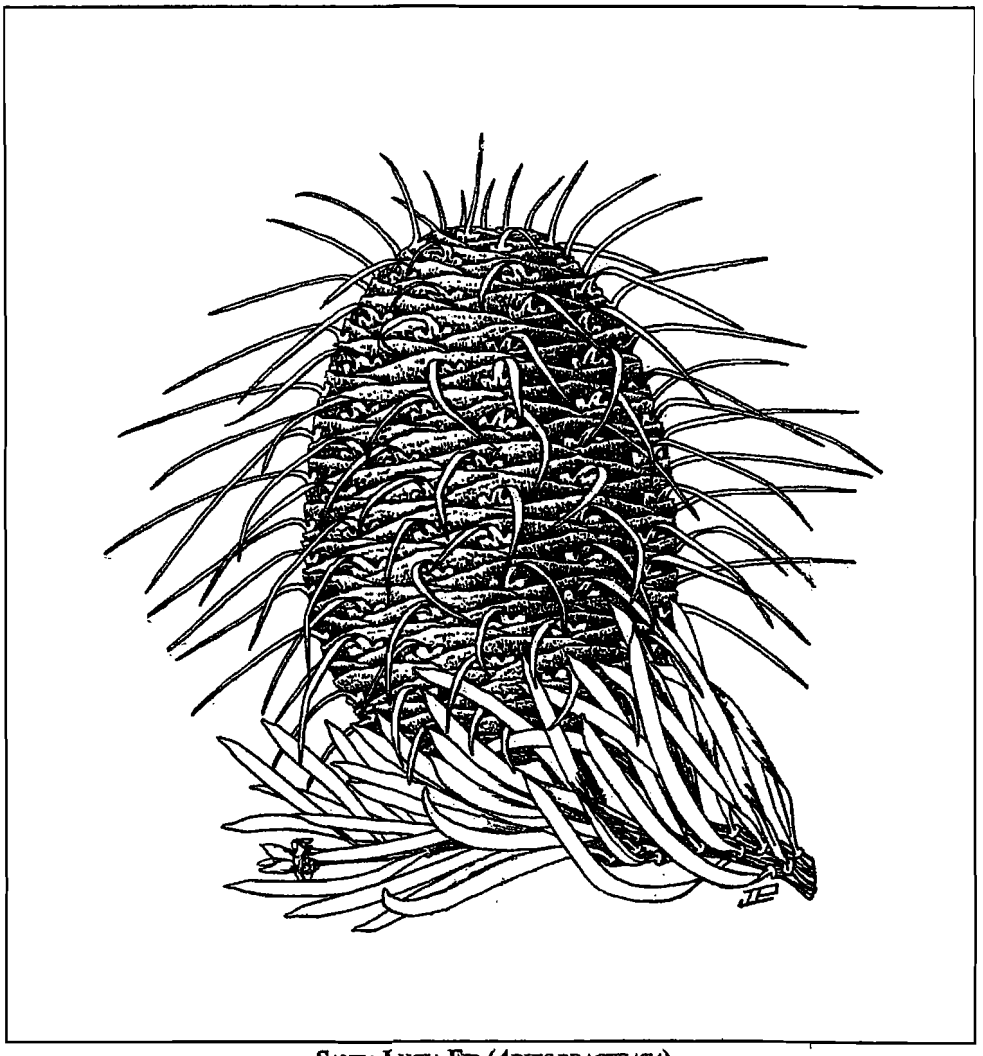
A FLORA OF TASSAJARA

THE VASCULAR PLANTS OF THE TASSAJARA REGION, VENTANA WILDERNESS, SANTA LUCIA MOUNTAINS, MONTEREY COUNTY, CALIFORNIA.



SANTA LUCIA FIR (*ABIES BRACTEATA*)

DAVID ROGERS

July 3, 1998

The following is a test copy of the basic text of "A Flora of Tassajara," including the bibliography, glossary and index. The plants are grouped according to the major divisions, and then are listed alphabetically by family, genera and species. I hope to have the final version of the text, with a rather lengthy introduction, maps, photographs and perhaps a few appendixes, completed by the end of the year. The introduction will include sections on plant life, geology, soils, and a history of land use.

Symbols

Preceding a text entry:
*= an introduced plant species.
⇩= plant species reaching their most southern distribution in the Santa Lucia Mountains.
⇧= plant species reaching their most northern distribution in the Santa Lucia Mountains.
⇳= plant species whose Santa Lucia Mountains populations are greatly disjunct from other populations.
Following a text entry:
⊛= the flowering period of a plant species.

PS, if you have questions, comments, or whatever, feel free to contact me.
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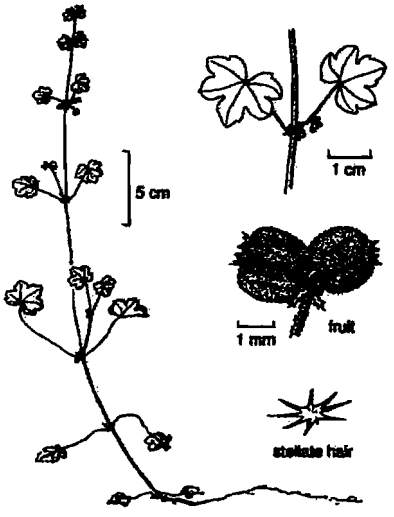
LATE ADDITIONS

APIACEAE. PARSLEY OR CARROT FAMILY

BOWLESIA.

Sixteen species of temperate South America, with one also in southwestern temperate North America. Amend the *Apiaceae* key, under 1b and 7a, to: 8a. Leaves lobed but not divided into leaflets. Small and weak-stemmed annual herbs of shady habitats... *Bowlesia*. 8b. Leaves one or more times divided into leaflets. Perennial herbs... etc.

Bowlesia incana Ruiz & Pavon. *HABIT*: delicate annual herbs with ascending or trailing stems ranging from about 1 to 6 dm. long. *LEAVES*: opposite and on petioles about 1 to 12 cm. long; the blades are about .5 to 3 cm. wide, roundish to reniform or cordate in outline and with 5 to 9 fairly deep lobes. *INFLORESCENCE*: the flowers are very small and produced singularly or in small umbels of up to 6 flowers; the umbels are sessile or shortly pedunculate in the axils of the leaves. *COROLLA*: five minute yellowish-green petals. *FRUIT*: ovate to round, inflated, 1 to 2 mm. long, and splitting into two carpels in maturity. *OCCURRENCE*: this shade-loving species is apparently rare in the Tassajara region, for I have found it only on the steep rocky slope to the left as one is facing the waterfall southwest of Tassajara Hot Springs. *DISTRIBUTION*: from Sonoma County in the Coast Ranges, and from Amador County in the Sierra Nevada, to northern Baja California, and eastward to Texas and Louisiana. Also in South America. ⊛March–May.



Bowlesia incana

Viola ocellata

VIOLACEAE. VIOLET FAMILY

VIOLA

See page 180 for the other local species. Amend the key to: 1a. Inner surface of petals generally white with yellow bases, the two lateral petals with dark purple spots at the base... *V. ocellata*. 1b. Inner surface of petals basically yellow or orangish, etc.

⇩***Viola ocellata*** Torrey & Gray. TWO-EYED VIOLET, WESTERN HEART'S EASE. *HABIT*: small perennial herbs from a generally erect rhizome; the stems are erect to trailing and about 5 to 37 cm. long. *LEAVES*: basal leaves are larger and on petioles up 15 cm. long; the blades strongly cordate to truncate and about 1 to 6 cm. long. The cauline leaves are smaller and less cordate. *INFLORESCENCE*: the flowers are produced in the axils of the leaves on peduncles about 1 to 10 cm. long. *COROLLA*: five asymmetrical and primarily white petals about 8 to 15 mm. long. The bases are yellow, and the two upper petals are deep red-violet on the back. The two lateral petals have dark purple spots (eyes) at the base, and the lower petal has reddish-purple veins. *FRUIT*: a round-ovoid capsule about 5 to 8 mm. long. *OCCURRENCE*: discovered on Pine Ridge by Heather Gates in 1998; the plants were growing on serpentine. *DISTRIBUTION*: Coast Ranges and lower elevation Cascade Ranges, from southwestern Oregon to the Santa Lucia Mountains of Monterey County. ⊛March-June.

A Flora of Tassajara

Fairy Lanterns (*Calochortus Albus*)

David Rogers

A KEY TO THE DIVISIONS OF VASCULAR PLANTS.

1a. **Ferns** and **fern allies**, i. e., plants which reproduce by one-celled spores:
2a. **Fern allies**. Leaves absent; the nearest equivalent to leaves are either small scale-like formations or slender reed-like formations. Sporangia are produced in specialized areas terminating fertile stems:
3a. **Horsetails**. Reed-like plants with erect and hollow stems. The nearest equivalent to leaves are scale or sheath-like formations produced at the nodes, and sometimes slender reed-like structures borne in whorls below the scales. Spores are produced in cone-like structures terminating fertile stems. . . . . ***EQUISETOPHYTA***.
3b. **Moss-Ferns**. Moss-like plants with trailing or ascending stems. The nearest equivalent to leaves are small scale-like formations that are spirally arranged on the stems. Spores are produced on the inner surface of specialized "leaves" (sporophylls). . . . . ***LYCOPODIOPHYTA***.
2b. **Ferns**. Leaves (fronds) present and divided into segments or lobes. Spores are produced on the lower-surface of the fronds: . . . . . ***POLYPODIOPHYTA***.
1b. **Trees, shrubs** and **herbaceous plants** which reproduce by seeds (ovules that further develop after fertilization):
4a. **Coniferous trees**, i. e., trees with needle or scale-like leaves which lack true flowers. Ovules are naked and produced on the inner surface of (usually) spirally arranged pistillate (female) scales. Fertilization occurs on contact with air-borne pollen from staminate (male) catkins. The pistillate scales enlarge and become woody with age, forming a cone or similar structure. . . . . ***PINOPHYTA***.
4b. **Flowering plants**, i. e., broadleaf trees, shrubs, and herbaceous plants (including grasses and grass-like plants) with true flowers. Ovules are in enclosed in ripening pistils (ovaries). Fertilization occurs with contact of pollen with specialized receptive (usually terminal) organs (stigmas) which send pollen grains to the ovary. Pollen is transported by air, insects or birds. . . . . ***ANTHOPHYTA***.

EQUISETOPHYTA (Calamophyta). HORSETAILS.

A distinctive division comprised of only one family and one genus.

EQUISETACEAE. HORSETAIL FAMILY.

EQUISETUM. HORSETAILS.

A widely distributed genus (excepting for Australia and New Zealand) comprised of about 15 species of perennial herbs.

1a. Fertile and sterile stems physically dissimilar. Sterile stems with whorls of long, slender branches at the nodes (joints); fertile stems naked and terminated by spore producing cones. Stems often rapidly disintegrating at the end of the growing season:
2a. Sterile stems at least 3 mm. wide, and mostly from 3 to 12 dm. long. Fertile stems with 20 to 30 scale-like leaves at the nodes. . . . . ***E. telmateia***.
2b. Sterile stems usually less than 3 mm. wide, and less than 6 dm. long. Fertile stems with 8 to 12 scale-like leaves at the nodes. . . . . ***E. arvense***.
1b. All stems fertile and physically similar. Whorls of branches at the nodes, if present, are very short and stubby. Stems, even if produced annually, do not rapidly disintegrate at the end of the growing season:
3a. Stems slender, less than 4 mm. wide, and often with smaller, secondary stems from the base, and occasionally with short, finger-like branches whorled at the nodes. . . . . ***E. laevigatum***.
3b. Stems stout, 4-12 mm. wide, and never with secondary stems from the base, and never with branches at the nodes. . . . . ***E. hyemale***.

Equisetum arvense Linnaeus. COMMON HORSETAIL (p. 5). *HABIT*: perennial herbs from creeping rhizomes. Sterile stems are green and about 1 to 6 dm. (4-24") tall, with whorls of slender branches at the nodes, while the branchless fertile stems are more or less flesh-colored and about .5 to 2.5 dm. (2-10") tall. *CONE*: generally lance-ovoid to narrowly ellipsoid and about 2 to 3 cm. long. *OCCURRENCE*: scattered in more or less protected sites along streams, but rare. The sterile stems of the local plants appear to be of short duration, for I have seen them only from late spring to early summer (fertile stems are always of short duration). *DISTRIBUTION*: widely distributed in North America and Eurasia.

Equisetum hyemale Linnaeus var. **affine** (Engelmann) Eaton [*E. h.* var. *robustum* (A. Braun) Eaton, *E. h.* var. *californicum* Milde]. COMMON SCOURING RUSH (p. 5). *HABIT*: rhizomatic perennial herbs with erect, relatively stout, and scruffy-textured evergreen stems ranging from about 6 to 20 dm. (2-6.5') tall. The sheaths have a distinctive band pattern consisting of a broad white band, with equally broad black bands above and below the white band. *CONE*: generally ovoid and about 1 to 2.5 cm. long. *OCCURRENCE*: widely scattered in shady and perennially or seasonally moist habitats, but generally uncommon. *DISTRIBUTION*: widespread in temperate North America, from Alaska to the eastern United States and northern Baja California.

Equisetum laevigatum Braun [*E. funstonii* Eaton]. SLENDER HORSETAIL, SMOOTH SCOURING RUSH (p. 5). *HABIT*: rhizomatic perennial herbs with slender and erect stems ranging from about 4.5 to 1.8 dm. (1.5-6') tall. The primary stems often have shorter secondary stems rising from the base, and occasionally have short and stubby branches at the nodes. *CONE*: generally ovoid to lance-ovoid and about 1 to 2 cm. long. *OCCURRENCE*: the overall most common horsetail species in the Tassajara region, with small colonies widely scattered in generally shady and moist or seasonally moist habitats. *DISTRIBUTION*: widespread in temperate North America. *NOTE*: although the stems are produced annually, they do no rapidly disintegrate (like the stems of many horsetails), thus this species can be identified from dead material nearly year-round.

Equisetum telmateia Ehrhart subsp. **braunii** (Milde) Hauke [*T. e.* var. *b.* Milde]. GIANT HORSETAIL (p. 5). *HABIT*: rhizomatic and thick-stemmed perennial herbs of wet or moist habitats. The sterile stems are green with whorls of slender branches at the nodes, and (locally) are mostly about 3 to 12 dm. (1-4') tall. Fertile stems are whitish or brownish and about 2 to 6 dm. (8-24") tall. *CONE*: generally oblong-ovoid to lance-ovoid and about 4 to 8 cm. long. *OCCURRENCE*: widely scattered along perennial streams and occasionally at springs and seeps in the Tassajara region, but generally uncommon (except in

some areas, such as along the Carmel River west of Pine Valley Camp). The sterile stems of most of the local populations are of very short duration, typically manifesting for only a few of months from late spring to early summer (fertile stems are always of short duration). *DISTRIBUTION*: from British Columbia southward, through the Coast Ranges, to southern California.

LYCOPODIOPHYTA (Lepiophyta). FERN-MOSSES, QUILWORTS.

A division comprised of moss or grass like plants which includes *Lycopodiaceae* (Club-Moss Family), *Isoetaceae* (Quillwort Family), and *Selaginellaceae* (Spike-Moss Family).

SELAGINELLACEAE. SPIKE-MOSS FAMILY.

One genus and approximately 700 species of moss-like perennial herbs. While the family is represented nearly worldwide, most of the species are limited to tropical and warmer temperate regions.

SELAGINELLA. SPIKE-MOSS, RESURRECTION PLANT.

A genus comprised of approximately 700 species; most occur in tropical to warmer-temperate regions.

Selaginella bigelovii Underwood. BUSHY SELAGINELLA (p. 5). *HABIT*: moss-like plants with spreading or ascending stems ranging from about 5 to 20 cm. (2-8") long. The branching stems are covered with small and imbricated awl-shaped scales. The plants are dormant and grayish during dry periods, but are green during wet periods, and even the brief moisture a summer shower will cause the plants to quickly revive. *SPORANGIA*: located on the inner surface of specialized, terminal leaves (sporophylls). *OCCURRENCE*: widespread and locally common in the Tassajara region, mostly on open rocky slopes, but often on soiled slopes. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Napa, Sonoma, and Tulare Counties to northern Baja California.

NOTE: common on north or generally northfacing rock outcrops, cliffs, and tree trunks in this region are plants which may represent *Selaginella hansenii*, a species primarily of the Sierra Nevada Foothills, but with at least one disjunct population in the Santa Lucia Mts. near Jamesburg. Such plants have a profusion of prostrate but ultimately ascending branches, that are scaly-leafed and rooting at the nodes, and tending to form dense carpet-like mounds. As I was not able to locate any sporophylls on such plants, I am not sure if they are spike-mosses. Most herbarium specimens of *S. hansenii* have thicker stems than the plants of the Tassajara region, but thin-stemmed specimens strongly resemble the local plants.

POLYPODIOPHYTA (Pterophyta). FERNS.

A primarily tropical and taxonomically unstable (i.e., poorly understood) division of vascular plants comprised of about 29 families, 230 to 250 genera, and 9,000 to 11,000 species. Most of the species are herbaceous, but some are shrub or tree-like, such as the tree-ferns of Australia, New Zealand and Tasmania.

1a. Sporangia hidden under the reflexed margins of the leaf segments. . . . . ***Pteridaceae*** (*Adiantum, Cheilanthes, Pellaea*).
1b. Sporangia fully exposed or covered by indusium (a membranous tissue):
2a. Sporangia covered by indusium (the indusium shriveling in maturity):
3a. Sori elongated and slightly curved. . . . . ***Blechnaceae***.
3b. Sori round or horse-shoe shaped. . . . . ***Dryopteridaceae***.
2b. Sporangia without indusium:
5a. Sporangia not clustered into distinct sori, but scattered near the margins or along major veins:
6a. Fronds mostly 4 to 20 dm. (16-80") long. Stipes (petioles) stout, light colored, and not glossy. . . . . ***Dennstaedtiaceae***.
6b. Fronds mostly 1 to 4 dm. (4-16") long. Stipes slender, dark, and glossy. . . . . ***Pteridaceae*** (*Pentagramma*).
5b. Sporangia clustered into distinct sori:
7a. Sori round and produced in two parallel rows. . . . . ***Polypodiaceae***.
7b. Sori irregularly shaped and produced at the apex of major veins. . . . . ***Pteridaceae*** (*Aspidotis*).

BLECHNACEAE. DEER FERN FAMILY.

A family comprised of perhaps nine genera and approximately 250 species. Most of the species occur in tropical regions.

WOODWARDIA. CHAIN FERN.

About 13 species of Eurasia and North and Central America.

Woodwardia fimbriata Smith [*W. chamissoi* Brackenridge, *W. radicans* Smith var. *americana* Hooker]. GIANT CHAIN FERN (p. 5). *HABIT*: rhizomatic ferns producing circles of large evergreen fronds ranging from about 9 to 30 dm. (3-9.8') tall. *BLADES*: more or less broadly elliptic in outline and pinnately divided into numerous oblong-lanceolate pinnae, which, in turn, are pinnately cleft into many linear-lanceolate ultimate segments. *SORI*: elongated, slightly curved, and produced in two parallel rows. *OCCURRENCE*: widely scattered at springs and seeps in the Tassajara region, and tending to form dense thickets at a number of such sites, like at the spring which supplies the drinking water for the hot springs. Occasionally plants are found in protected sites along smaller perennial streams in this region, but

they are not as well developed as those which occur at springs or seeps (plants are essentially absent along the major streams of this region, probably due to an intolerance to torrential water flows). *Distribution*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from British Columbia to the Sierra de San Pedro Martir of northern Baja California. Also in the mountains of Arizona.

DENNSTAEDTIACEAE. Bracken-Fern Family.

About 17 genera and 375 species worldwide; most species occur in tropical regions.

PTERIDIUM. Bracken Fern.

One variable species of nearly worldwide distribution.

Pteridium aquilinum (Linnaeus) Kuhn var. **pubescens** Underwood [*Pteris aquilina* Linnaeus var. *lanuginosa* (Bory) Hooker]. Western Bracken Fern (p. 5). *Habit*: rhizomatic ferns with generally arching fronds ranging from about 3 to 15 dm. (1-5') tall. The fronds are produced annually from late spring to early summer. *Blades*: broad, generally triangular in outline, and intricately foliated. The upper divisions are twice pinnate, while the larger lower divisions are three times pinnate. *Sporangia*: concentrated in nearly continuous bands on the lower margins of the segments. *Occurrence*: widely scattered and locally common to abundant in the Tassajara region, such as along Willow Creek, in The Pines, on Pine and Chew's Ridges, etc., although totally absent in most areas. Plants that grow in constantly moist situations, such as at springs, tend to be much larger than those growing in habitats that are seasonally dry. *Distribution*: widespread in North America, from Alaska to the mountains of northern Baja California and north-central Mexico, and eastward to eastern Canada and New England.

DRYOPTERIDACEAE. Wood Fern Family.

About 60 genera and more than 1000 species worldwide. Like many fern families, most of the species are restricted to tropical regions.

1a. Pinnae simple, the margins serrately toothed but not deeply lobed. . . . . ***Polystichum***.
1b. Pinnae deeply lobed or divided into distinct segments:
2a. Evergreen ferns with fronds ranging from about 3 to 10 dm. long, and with blades about 1.2 to 3 dm. wide. Generally not found on rock formations. . . . . ***Dryopteris***.
2b. Delicate ferns with dry-season deciduous fronds ranging from about .5 to 3.7 dm. long, and with blades less than 1 dm. wide. Found mostly on rock formations (cliffs, rock outcrops, cracks in boulders, etc.). . . . . ***Cystopteris***.

CYSTOPTERIS. Bladder Fern, Fragile Fern.

About 10 species that are primarily of temperate regions.

Cystopteris fragilis (Linnaeus) Bernhardi. Brittle Fern (p. 7). *Habit*: small ferns from relatively short rhizomes, with delicate and easily broken fronds ranging from about .5 to 3.7 dm. (2-15") tall. The fronds arise at the start of the rainy season and whither away at the start of the dry season, except in perennially moist habitats. *Blades*: lance to ovate oblong in outline, about 1 to 2.5 dm. long, and pinnately divided into distinct segments that are pinnately toothed or lobed. *Sori*: ovate to roundish and produced along the major veins. *Occurrence*: widely scattered in the Tassajara Canyon and vicinity, but restricted to rocky areas in deeply shady and more or less moist or seasonally moist woodland habitats. *Distribution*: one of the most widely distributed of all vascular plant species, and occurring in both temperate and tropical regions nearly worldwide.

DRYOPTERIS. Wood Fern.

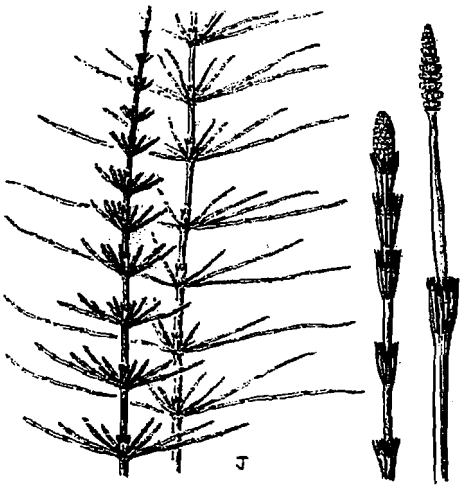
Approximately 100 species worldwide, and especially well represented in Eastern Asia.

Dryopteris arguta (Kaulfuss) Watt [*Aspidium arguta* Kaulfuss, *D. rigida* Swartz var. *argu-tum* Eaton]. California Wood Fern (p. 7). *Habit*: evergreen ferns from relatively stout, woody and generally ascending rhizomes, with crowns of fronds ranging from about 3 to 10 dm. (12-39") tall. *Blades*: ovate-lanceolate to oblong-lanceolate in outline and bipinnately divided into ultimate segments that are pinnately toothed or lobed. *Sori*: produced in two parallel rows and covered with horse-shoe or kidney-shaped indusium. *Occurrence*: widespread and locally common in the Tassajara region, mostly on shady woodland slopes, but also fairly common under dense stands of tall *Ceanothus* dominated chaparral. *Distribution*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from British Columbia to the Sierra San Pedro Martir, northern Baja California. Also in the mountains of Arizona.

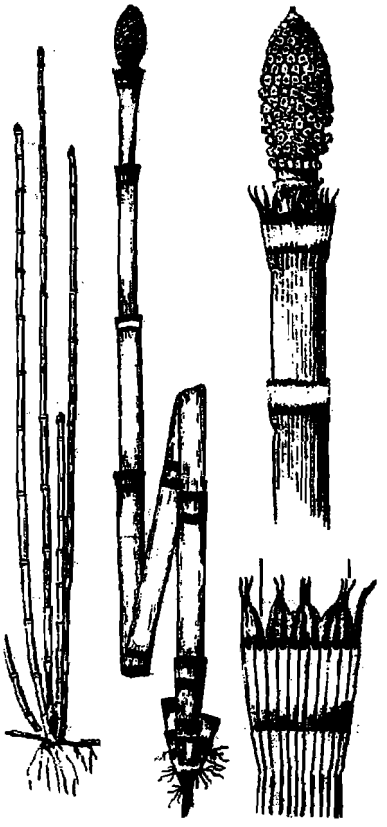
POLYSTICHUM. Sword Fern, Christmas Fern, Holly Fern.

A widely distributed genus of approximately 175 species.

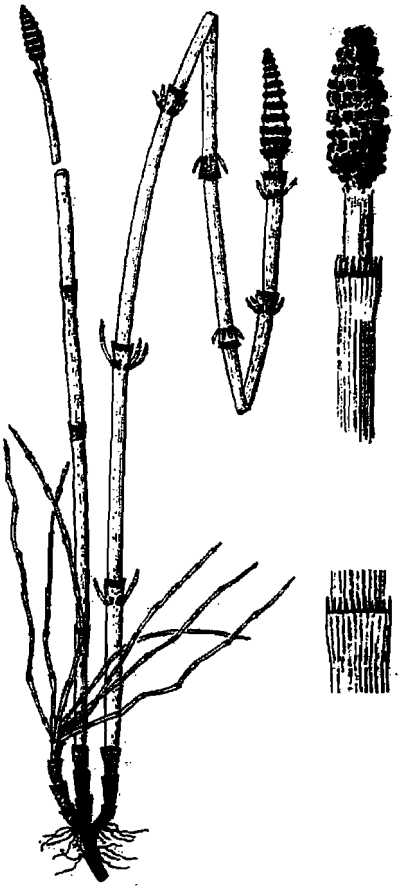
1a. Fronds mostly less than 5 dm. (20") long. Pinnae 2 to 3 cm. long, generally at an angle to the axis of the frond, and abruptly tapering to a relatively blunt apex. . . . . ***P. imbricans imbricans***.
1b. Fronds mostly 5 to 10 dm. (20-40") long. Pinnae usually much more than 3 cm. long, generally on a single plane, and gradually tapering to an upwardly curled, pointed apex. . . . . ***P. imbricans curtum***.



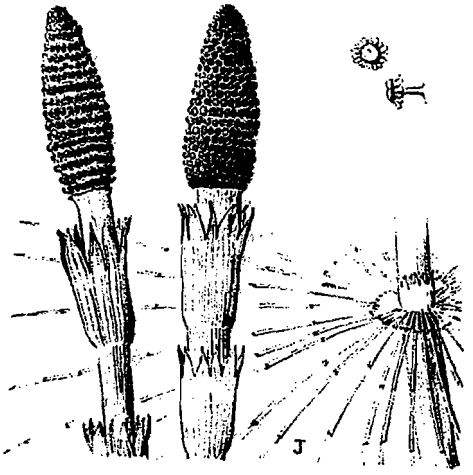
Equisetum arvense



Equisetum hyemale affine



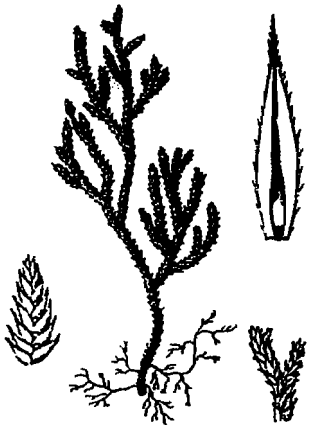
Equisetum laevigatum



Equisetum telemateia braunii

Woodwardia fimbriata

Pteridium aquilinum pubescens



Selaginella bigelovii

Polystichum imbricans (Eaton) Wagner [*P. munitum* subsp. *imbricans* (Eaton) Maxon]. DWARF SWORD FERN (p. 7). *HABIT*: evergreen ferns with erect or ascending rhizomes which produce tufts of fronds ranging from about 3 to 5 dm. (12-20") long. *BLADES*: lanceolate to lance-oblong in outline and pinnately divided into simple (and more or less imbricated) pinnae, the margins of which are serrate. *SORI*: borne in two parallel rows, and partially covered with indusium. *OCCURRENCE*: widely scattered and fairly common in the Tassajara region, primarily in shady woodland habitats. *DISTRIBUTION*: from British Columbia southward, through the Cascades, Sierra Nevada, Coast Ranges and mountains of southern California, as far south as San Diego Co.

Polystichum imbricans (Eaton) Wagner subsp. **curtum** (Ewan) Wagner [*P. munitum* (Kaulfuss) Presl subsp. *curtum* Ewan]. SOUTHERN SWORD FERN (p. 7). *HABIT*: evergreen ferns which are very similar to the typical species, except for the much longer fronds (5 to 10 dm. [20-40"] long), more narrowly lanceolate blades, and longer pinnae (3 to 10 cm. long). *OCCURRENCE*: widely scattered and locally common in the Tassajara region, mostly in shady woodland habitats. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Santa Cruz and Santa Clara Counties to San Diego Co.; also in the northern and central Sierra Nevada.

POLYPODIACEAE. POLYPODY FERN FAMILY.

About 46 genera and approximately 650 species worldwide, but primarily of the tropical regions of North and South America.

POLYPODIUM. POLYPODY FERN.

About 160 species primarily of the tropical regions of the Americas.

1a. Blades deltoid to oblong-ovate in outline, the segments oblong and obtuse or slightly acute at the apex, the veins more or less netted. . . ***P. californicum.***

1b. Blades lanceolate in outline, the segments linear-attenuate and acute at the apex, the veins free, rhizome with a licorice taste. . . . . ***P. glycyrrhiza.***

Polypodium californicum Kaulfuss. CALIFORNIA POLYPODY FERN (p. 7). *HABIT*: perennial herbs from creeping rhizomes which produce numerous fronds ranging from about 2 to 5 dm. (8-20") long. The fronds are produced quickly after the onset of the rainy season and wither with equal speed at the beginning of the dry season. *BLADES*: deltate to oblong-ovate in outline and deeply and pinnately divided into oblong lobes. *SORI*: roundish and produced in two parallel rows on the lower side of the fronds. *OCCURRENCE*: widespread and locally common on shady or semi-shady rock outcrops and cliffs in the Tassajara region; the frequently dense stands of fronds are a common and conspicuous aspect of the region's vegetation during the rainy season. *DISTRIBUTION*: Coast Ranges, Transverse Ranges, Peninsular Ranges and the Sierra Nevada foothills, from Humboldt and Butte Counties to northern Baja California. *NOTE*: it is possible that some of the plants of this region here assigned to *P. californicum* may represent *P. calirhiza* Whitmore & Smith, a taxon which is reported from the Santa Lucia Mountains (Whitmore & Smith '91, Matthews '97). In *P. calirhiza* the blades are oblong-ovate and regular in outline (as opposed to deltate to oblong-ovate and often irregular in outline), the first 1 to 3 pairs of pinnae are usually shorter than those above (as opposed to about as long or longer), the sori are ovate and raised (as opposed to more or less round and sunken and flat), and the rhizome has an acrid plus slightly sweet taste (as opposed to bland or very slightly sweet). *P. calirhiza* probably derived from a hybridization between *P. californicum* and *P. glycyrrhiza*.

⇩**Polypodium glycyrrhiza** D. C. Eaton [*P. vulgare* var. *occidentale* Hooker]. LICORICE FERN (p. 7). *HABIT*: rhizomatic evergreen perennial herbs which produce fronds ranging from about 2 to 7 dm. (8-28") long. *BLADES*: generally lanceolate in outline and pinnately divided into linear to linear-attenuate segments. *SORI*: round or sometimes oval and produced in two parallel rows on the lower surface of the blades. *OCCURRENCE*: scattered in permanently moist habitats along Willow Creek. *DISTRIBUTION*: along the Pacific Coast from the Aleutian Islands (and perhaps the Kamtchatka Peninsula) to Monterey Co. *NOTE*: the local plants probably represent hybrids between *P. glycyrrhiza* and *P. calirhiza*.

PTERIDACEAE. BRAKE-FERN FAMILY.

A widely distributed family comprised of about 40 genera and about 500 species.

1a. Sporangia fully exposed on the lower surface of blade segments:

2a. Sporangia clustered in distinct sori at the ends of major veins. Uncommon in this region, and restricted to rock outcrops and cliffs. . . . ***Aspidotis.***

2b. Sporangia diffuse and scattered along major veins. Common in this region, and found in shady or generally shady habitats. . . . . ***Pentagramma.***

1b. Sporangia concealed under the reflexed margins of blade segments:

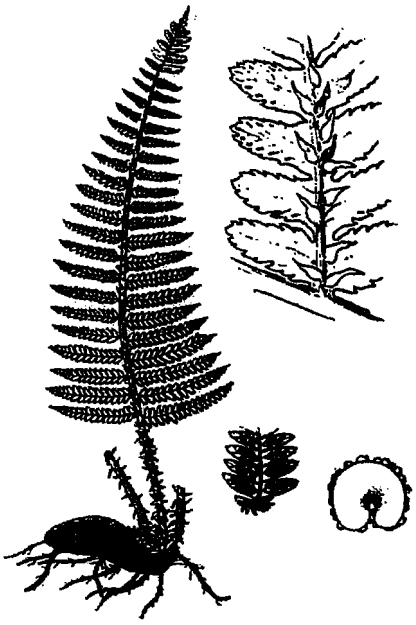
3a. Lower surface of blade segments scaly, fibrous or densely pubescent. . . . . ***Cheilanthes.***

3b. Blades glabrous throughout:

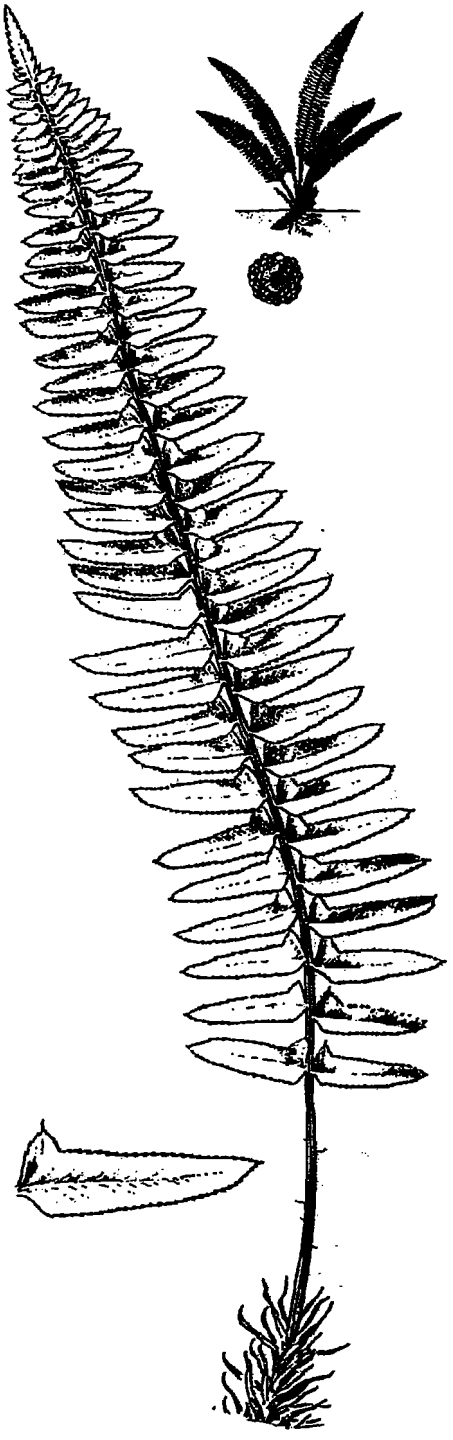
4a. Margins of blade segments, or at least fertile blade segments, slightly to deeply lobed and/or incised. . . . . ***Adiantum.***

4b. Margins of all blade segments entire. . . . . ***Pellaea.***

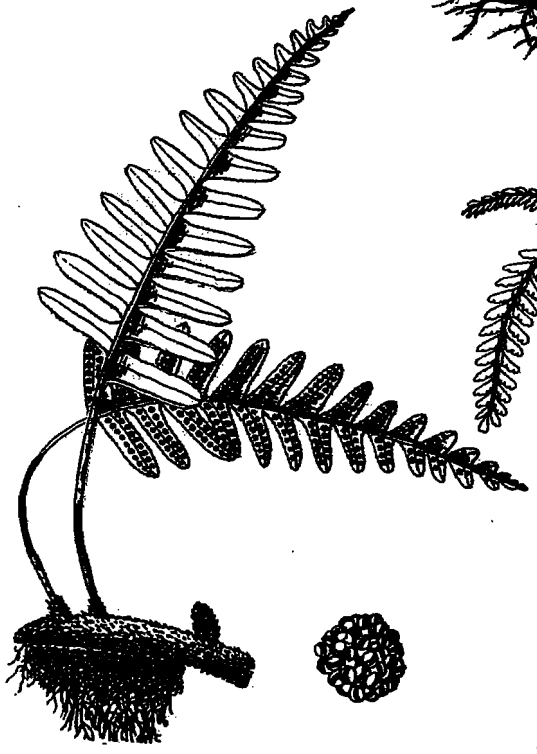
Cystopteris fragilis



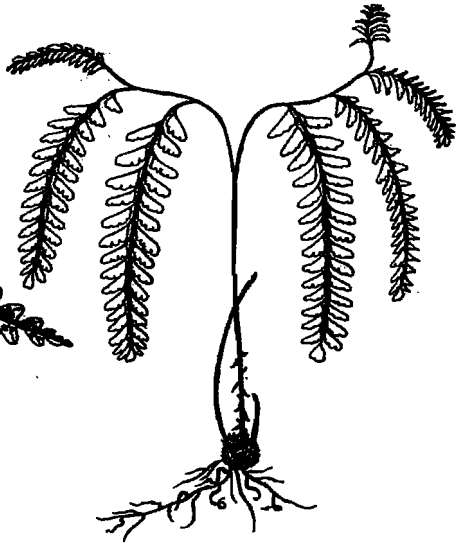
Dryopteris arguta



Polystichum imbricans imbricans



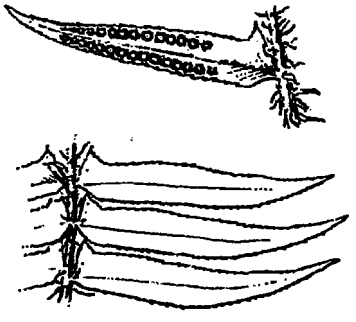
Polypodium californicum



Adiantum aleuticum

Polypodium glycyrrhiza

Adiantum capillus-veneris



Polystichum imbricans curtum

ADIANTUM. MAIDEN-HAIR FERNS.

Approximately 200 species of tropical and temperate regions.

1a. Blades palmately divided. . . . . ***A. aleuticum.***
1b. Blades pinnately divided:
2a. Margins of leaflets shallowly-lobed to entire, the sterile leaflets not toothed. . . . . ***A. jordani.***
2b. Margins of leaflets deeply-lobed or incised, the sterile leaflets finely toothed. . . . . ***A. capillus-veneris.***

Adiantum aleuticum (Ruprecht) Paris [*A. pedatum* Linnaeus var. *aleuticum* Ruprecht]. FIVE-FINGER FERN, WESTERN MAIDEN-HAIR FERN (p. 7). *HABIT*: distinctive evergreen ferns with fronds ranging from about 2 to 8 dm. (8-32") long. The slender and glossy stipes are dark brown to nearly black. *BLADES*: palmately branched into two or more divisions about 1 to 4 dm. (4-16") long. The divisions are pinnately divided into crowded segments; the lower margins are entire and the upper toothed. *SPORANGIA*: concealed under the reflexed outer margins. *OCCURRENCE*: scattered in moist, shady, and usually rocky places in more densely wooded areas in the Tassajara region, such as in the upper regions of Tassajara Creek, Church Creek, Oryoki Creek, Willow Creek, Pine Valley, Miller's Canyon, etc. *DISTRIBUTION*: widespread in western North America, from Alaska southward, to the San Gabriel and San Bernardino Mts. of southern California on the Pacific Slope, and to New Mexico in the Rocky Mts. Also on serpentine in eastern Canada and the northeastern U. S.

Adiantum capillus-veneris Linnaeus. VENUS-HAIR FERN, COMMON MAIDEN-HAIR FERN (p. 7). *HABIT*: delicate ferns with fronds ranging from about 2 to 7 dm. (8-28") tall. The stipes are very slender, glossy, and nearly black in color. *BLADES*: bipinnately to tripinnately divided into obovate to roundish leaflets with irregularly lobed or incised margins. *SPORANGIA*: concealed under the reflexed margins of the leaflets. *OCCURRENCE*: widely scattered in a variety of shady habitats at lower to intermediate elevations in the Tassajara region, but best developed in permanently wet and deeply shady habitats that are rarely affected by seasonal flooding, such as at springs and seeps. Plants are also scattered in the dense shade of arborescent *Ceanothus oliganthus sorediatus* and/or *C. integerrimus* dominated chaparral, but in a much more depauperate form. *DISTRIBUTION*: one of the most widely distributed of all plant species, ranging through the temperate and tropical regions of both the northern and southern hemispheres. *NOTE*: the erratic distribution and relatively late dates of the earliest collections of this species in California suggest that it may not be native; the earliest Monterey Co. specimen on file at the California Academy of Sciences Herbarium in San Francisco was collected at Tassajara Hot Springs by William Dudley in August of 1903.* If this is an introduced species, it is curious as to how it became established in this remote wilderness region at such an early date. *John Thomas annotated Dudley's specimen as "probably near California Redwood Park" (now Big-Basin Redwood State Park in Santa Cruz Co.), but the specimen label states the site of collection as "Hot Springs, Santa Lucia Mountains, Monterey Co.," and Dudley was at Tassajara in August of 1903 (as evidenced by his collection of *Lobelia dunnii serrata* on August 6, 1903).

Adiantum jordani Mueller [*A. emarginatum* Hooker]. CALIFORNIA MAIDEN-HAIR FERN (p. 9). *HABIT*: delicate ferns with fronds ranging from about 5 to 5 dm. (8-20") tall. The very slender and glossy stipes are dark brown to nearly black. *BLADES*: bipinnately to tripinnately divided into generally fan-shaped leaflets. *SPORANGIA*: concealed under the upper reflexed margins of the leaflets. *OCCURRENCE*: widely scattered and locally common on shady woodland slopes in the Tassajara region, generally below about 3,500 ft., and most frequently found near the bases of trees, boulders and large rocks. *DISTRIBUTION*: Coast, Transverse, and Peninsular Ranges, from southwestern Oregon to the mountains of northern Baja California. Also scattered in the Sierra Nevada, but rare.

ASPIDOTIS. LACE-FERN.

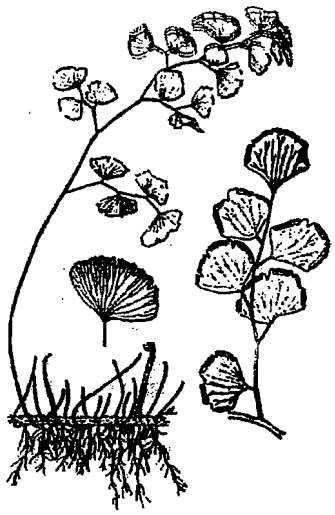
Four species of western North America. Three species occur in California, and two are endemic to the California Floristic Province.

1a. Blade segments and lobes linear and more or less entire. Sporangia continuous on both sides of midvein. False indusium with many shallow and regular teeth. . . . . ***A. densa.***
1b. Blade segments lanceolate to triangular and often with remote teeth. Sporangia not continuous on both sides of midvein. False indusium with few to many deep and irregular teeth:
2a. False indusium about as wide as long, generally free, 1-2 (-5) per segment, and entire or with only a few teeth. . . . . ***A. californica.***
2b. False indusium often wider than long, generally fused at the base, 3-5 (-7) per segment, and with many teeth or lobes. . . . . ***A. carlotta-halliae.***

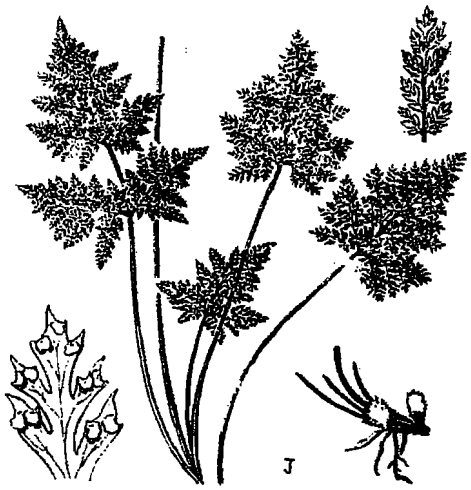
Aspidotis californica (Hooker) Nuttall [*Cheilanthes c.* (Hooker) Metterius]. CALIFORNIA LACE FERN (p. 9). *HABIT*: small ferns with delicate and intricately-foliated fronds ranging from about 1 to 3 dm. (4-12") tall. *BLADES*: three to four times pinnately divided into generally decurrent and often toothed ultimate segments. *SPORANGIA*: produced on the lower surface of the segments, mostly towards the apex. *OCCURRENCE*: lightly scattered on rock outcrops and cliffs in the Tassajara region, mostly at lower to intermediate elevations, but also up to 4,500 ft. on Pine Ridge. Near the hot springs plants can be found on the cliffs just beyond the lower barn and on a rock outcrop near the start of the trail to the Hog's Back. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Humboldt and Butte Co's southward to the Sierra Juarez, northern Baja California.

Aspidotis carlotta-halliae (Wagner & Gilbert) Lellinger [*Cheilanthes c-h.* Wagner & Gilbert]. SERPENTINE LACE FERN. *HABIT*: small ferns strongly resembling *C. californica*, except for the characteristics listed in the key, and the plants are also generally smaller. *OCCURRENCE*: rare on the serpentine outcrop that extends from Pine Ridge to Bear Basin (re. Vern Yadon (CAS, May 1970). *DISTRIBUTION*: scattered in the Coast Ranges from Marin County to San Luis Obispo County, and occurring mostly on serpentine outcrops. *NOTE*: this is a fertile hybrid between *A. Californica* and *A. densa*.

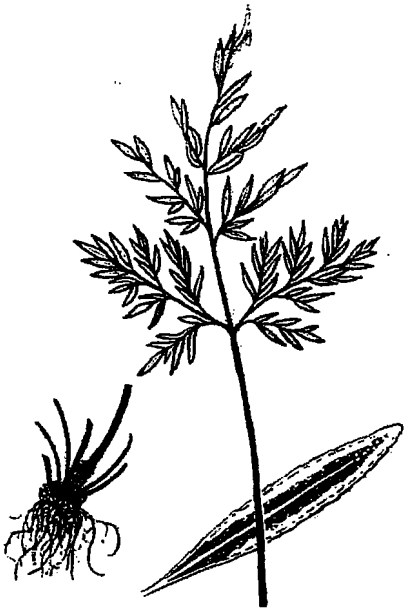
Aspidotis densa (Brackenridge) Lellinger [*Onychium d.* Brackenridge, *Pellaea d.* Hooker, *Cheilanthes siliquosa* Maxon]. INDIAN'S DREAM, OREGON CLIFF-BRAKE (p. 9). *HABIT*: small ferns from short rhizomes which typically produce dense tufts of fronds ranging from about .5 to 3 dm. (2-12") tall. *BLADES*: bipinnately to tripinnately divided into linear to elliptic segments. *SPORANGIA*: produced in lines on both sides of the midvein of the blade segments. *OCCURRENCE*: scattered in rocky areas on the serpentine outcrop that extends from Pine Ridge to Bear Basin (Griffin '75), but not known to occur elsewhere in this region. *DISTRIBUTION*: from British Columbia to Montana and Utah in the Rocky Mountains, and along the Pacific Slope, from British Columbia to Kern County in the Sierra Nevada, and to Santa Lucia Mountains of San Luis Obispo County in the Coast Ranges. Also on the Gaspe Peninsula of southeastern Canada. In California the species is commonly found on serpentine outcrops.



Adiantum jordani

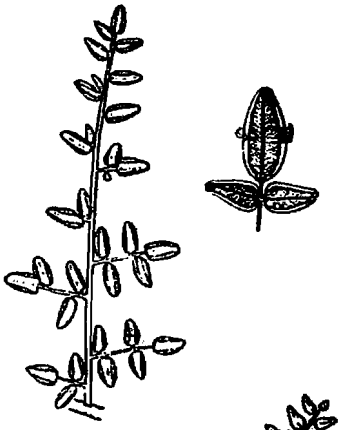


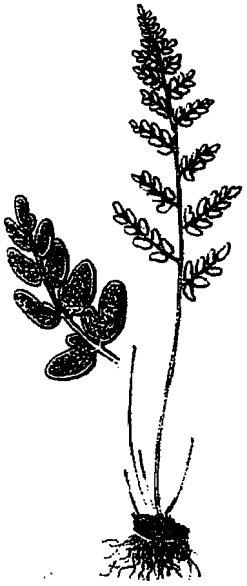
Aspidotis californica



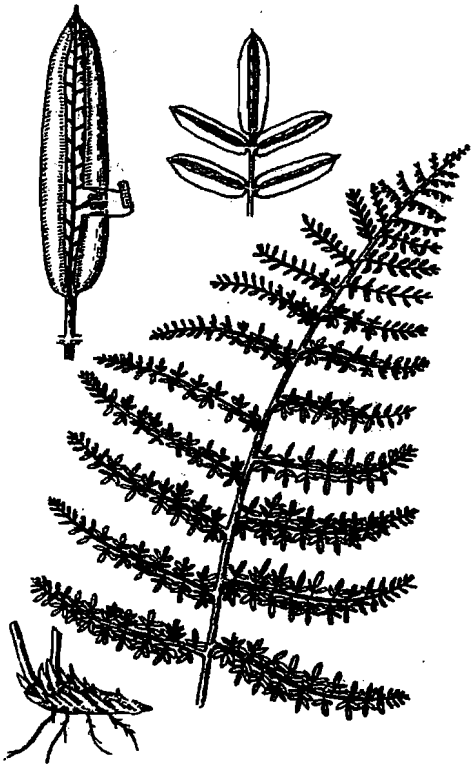
Aspidotis densa

Cheilanthes covillei

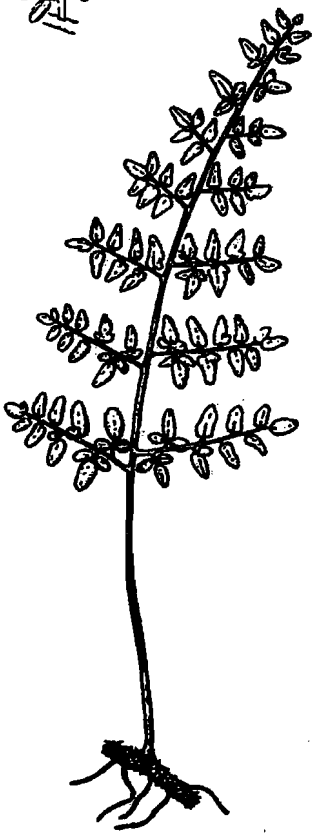




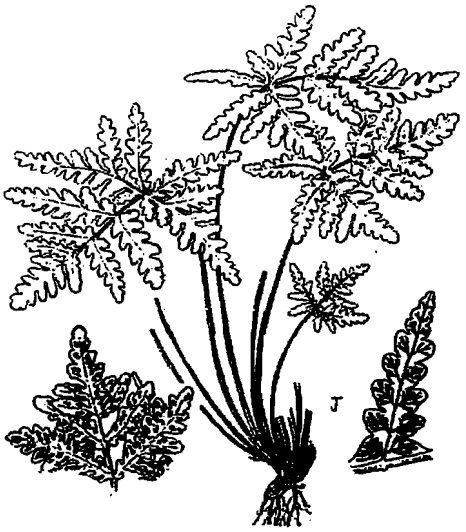
Cheilanthes gracillima



Pellaea mucronata



Pellaea andromedifolia



Pentagramma triangularis

CHEILANTHES. CLIFF-BRAKE.

Approximately 150 species primarily of drier habitats of North and South America.

1a. Blades usually twice pinnate. Segments mostly oblong, and densely tomentose below. . . . . ***C. gracillima.***
1b. Blades three to four times pinnate. Segments nearly round, and subtended by thin scales and long hairs. . . . . ***C. covillei.***

Cheilanthes covillei Maxon. BEAD FERN, LIP-FERN (p. 9). *HABIT*: small ferns of rock outcrops and cliffs, with short rhizomes and tufts of fronds ranging from about 1 to 2 dm. (4-8") long. *BLADES*: rather exotic, for they are three to four times pinnately dissected into small and dark-green bead-like segments that are connected by thread-like stems. The segments of young fronds appear to float on a "cloud" of white-translucent scales and white fibers that are borne on the lower side of the blade. *SPORANGIA*: concealed under the reflexed margins of the segments. *OCCURRENCE*: widely scattered in suitable habitats in the Tassaara region, but generally uncommon. Near the hot springs plants can be found on the cliffs just beyond the lower barn and on cliffs surrounding The Narrows. *DISTRIBUTION*: from Mendocino and Lake Counties southward in the Coast Ranges, and from Lassen Co. southward in the Sierra Nevada, to the Transverse and Peninsular Ranges of southern California and northern Baja California, and eastward to the mountains to Utah and Arizona. *NOTE*: as the very similar (and perhaps not specifically distinct) *C. intertexta* (Maxon) Maxon has been reported to occur on some of the higher peaks of the Santa Lucia Mountains, it may be present on cliffs and rock outcrops at higher elevations of the Tassajara region.

⇩/**Cheilanthes gracillima** Eaton. LACE FERN (p. 9). *HABIT*: small ferns of rock outcrops and cliffs, with short rhizomes which produce tufts of fronds ranging from about 5 to 25 cm. (2-10") long. *BLADES*: linear to lanceolate in outline and bipinnately divided into oblong segments. The segments are densely tomentose below. *SPORANGIA*: borne under the reflexed margins of the segments. *OCCURRENCE*: the only areas in the Tassajara region were this species is known to occur is in rock outcrops on the northern extensions of the Elephant's Back, where it was discovered by Vern Yadon in 1980, and on the south slope of Pine Ridge, where it was collected by Leroy Abrams on May 12, 1920 (Abrams #7411 DS). *DISTRIBUTION*: from British Columbia eastward to the northern Rockies of western Montana, and southward along the Pacific Slope to Tulare Co. in the Sierra Nevada, and to Lake and Mendocino Counties in the Coast Ranges, with disjunct populations on Mt. Tamalpias in Marin Co., on Mt. Hamilton in Santa Clara Co., and on some of the higher peaks and ridges of the Santa Lucia Mts. of Monterey Co.

PELLAEA. CLIFF-BRAKE.

About 35 species of tropical and temperate regions.

1a. Blade segments mostly oblong or ovate, fairly rounded at the apex, spaciously arranged, blue-green during the rainy season and reddish brown during the dry season. . . . . ***P. andromedifolia.***
1b. Blade segments narrowly elliptic, acute at the apex, crowded, gray-green during rainy season and gray during the dry season. . . . . ***P. mucronata.***

Pellaea andromedifolia (Kaulfuss) Fee [commonly misspelled *andromedaefolia*]. COFFEE FERN (p. 9). *HABIT*: rhizomatic ferns with distinctive fronds ranging from about 1.5 to 7 dm. (6-28") tall. *BLADES*: two to three times pinnately divided into generally remote and oblong to oblong-ovate segments. The segments are bluish-green above and light green below during the rainy season, but turn reddish-brown during the dry season (hence the name "Coffee Fern"). *SPORANGIA*: concealed under the reflexed margins of the segments. *OCCURRENCE*: common in shady or partly-shady (and often rocky) habitats at lower to intermediate elevations in the Tassajara region, but generally uncommon above about 3,000 ft. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Mendocino and Butte Counties to northern Baja California.

Pellaea mucronata (Eaton) Eaton [*P. ornithopus* Hooker]. BIRD'S-FOOT FERN (p. 9). *HABIT*: short-rhizomed ferns with coarse fronds ranging from about 1.5 to 5 dm. (6-20") tall. *BLADES*: two to three times pinnately divided into crowded and linear-oblong to elliptical segments about 2 to 6 mm. long. The segments are gray-green during the rainy season and gray during the dry season. *SPORANGIA*: concealed under the reflexed margins of the segments. *OCCURRENCE*: widely scattered and locally common on fully exposed, poor-soiled and often rocky habitats in the Tassajara region, particularly on southern slopes dominated by chaparral. *DISTRIBUTION*: Coast Ranges, from Mendocino Co. southward, and the Sierra Nevada Foothills, from Butte Co. southward, to the Transverse and Peninsular Ranges of southern California and northern Baja California.

PENTAGRAMMA. GOLDEN-BACK FERN.

Two species of western North America.

Pentagramma triangularis (Kaulfuss) Yatskievych, Windham & Wollenweber [*Pityrogramma t.* (Kaulfuss) Maxon, *Gymnogramme t.* Kaulfuss] (p. 9). *HABIT*: shortly-rhizomatic ferns with fronds ranging from about 1.5-4 dm. (6-16") tall. The fronds are usually evergreen, but may wither during the summer months of exceptionally dry years. The stems are slender, glossy, and dark brown to reddish-brown. *BLADES*: generally triangular in outline, with the upper pinnae pinnately divided, and the lower (and larger) pinnae bipinnately divided. The common name refers to the pale-yellowish under surfaces of the blades. *SPORANGIA*: scattered along major veins. *OCCURRENCE*: widespread and locally common in the Tassajara region, and occurring mostly in shade or partial shade in both woodlands and chaparral. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California.

PINOPHYTA (Coniferophyta). CONIFEROUS TREES.

A division comprised of about nine families, 64 genera and approximately 570 species. The division includes *Pinaceae* (pine, fir, douglas fir, spruce, hemlock, etc.) *Cupressaceae* (cypress, cedar and juniper), *Ginkgoaceae* (ginkgo), *Taxodiaceae* (redwood, bald cypress, Japanese cedar, etc.), *Araucaria* (monkey-tail tree, Norfolk Island pine, etc.), *Taxaceae* (yew, California nutmeg, etc.), *Ephedraceae* (Mormon tea) and *Cycadaceae* (the cycads and related plants).

1a. Leaves opposite, branched, and comprised of numerous flat scale-like segments. . . . . ***Cupressaceae.***
1b. Leaves alternate, often in bundles, not branched, and narrowly linear to narrowly oblong. . . . . ***Pinaceae.***

CUPRESSACEAE. CYPRESS FAMILY.

A widely distributed family comprised of 17 genera and about 120 species of evergreen trees and shrubs.

CALOCEDRUS. BEAUTIFUL CEDAR.

Three species; two of eastern Asia and one of western North America.

Calocedrus decurrens (Torrey) Florin [*Libocedrus d.* Torrey]. INCENSE CEDAR (p. 13). *HABIT*: aromatic evergreen trees with generally conical crowns ranging from about 20 to 35 m. (65-115') tall when mature, with exceptionally large trees ranging upward to 50 m. (160') tall. The trunks of older trees are typically quite broad at the base but taper rather rapidly upward. *BARK*: reddish-brown and fibrous, and thus similar to the bark of redwoods. *LEAVES*: light green, branched, and comprised of flattened scale-like segments. *CONES*: small, two-seeded, about 2 to 2.5 cm. long, and comprised of three woody scales. *SEEDS*: yellowish to reddish-brown and about 8 to 12 mm. long, inclusive of the two unequal wings. *OCCURRENCE*: a common member of the mostly coniferous forest which extends from Pine Ridge to Bear Basin. A lone tree also occurs on an oak-woodland slope about ½ mile north of Tassajara Hot Springs, in a ravine about 200 feet above Tassajara Road, a short distance north of the first hairpin curve as one is leaving the hot springs. *DISTRIBUTION*: from the Cascade Ranges of northern Oregon to Napa Co. in the north Coast Ranges, and almost continuous through the Sierra Nevada to Kern Co., with scattered populations in the Transverse and Peninsular Ranges of southern California and northern Baja California, and with disjunct populations in the Santa Lucia Mts. of Monterey Co. and on San Benito Mt. in the Diablo Range. *NOTE*: the wood has the familiar scent of a freshly sharpened pencil, the manufacturing of which is one of the more common uses of the wood of this species.

PINACEAE. PINE FAMILY.

Ten genera and approximately 193 species that are primarily of the northern hemisphere.

1a. Leaves produced singularly. Cones facing upward on the branches; cone scales falling upon maturation of the cones. . . . . ***Abies.***
1b. Leaves produced in bunches of three's (in the local species). Cones hanging downward on the branches; cone scales persistent. . . ***Pinus.***

ABIES. FIR.

Thirty nine species of boreal and montane regions of the northern hemisphere.

Abies bracteata D. Don ex Poiteau [*A. venusta* (Douglas) Koch]. SANTA LUCIA FIR, BRISTLE-CONE FIR (p. 14). *HABIT*: densely foliated evergreen trees with sharply pointed (spire-like) crowns ranging from about 10 m. (33') tall in dry, rocky and exposed habitats, to 30 m. (100') tall in moist canyon bottoms. Exceptionally large trees having been reported to be up to 50 m. (160') tall. The thin-barked trunks are rarely free of branches for more than a few feet above the ground. *LEAVES*: dark green, narrowly linear, and about 2.8 to 6 cm. long. The upper surfaces are flat and shiny, while the lower surfaces have a distinct protruding midrib and two light-colored parallel lines. The leaves of lower branches are twisted at the base. *REPRODUCTIVE FEATURES*: pollen is produced in pale-yellow catkin-like strobili, and trees in this stage (starting in early May) are very conspicuous, even at long distances. The ovulate cones, which are at first green with a purplish-brown tinge and purplish-brown when fully mature, are about 5 to 10 cm. long, and produced on the upper side of the branches. The cone scales have strongly attached bracts which terminate with long pine needle-like awns. The cones mature in late summer, and begin to break apart in September. *SEEDS*: obovate-cuneate, about 8 to 10 mm. long, and with wings about 10 mm. long. *OCCURRENCE*: widely scattered at higher and intermediate elevations of the Tassajara region (i.e., above about 2,500'), mostly on talus or rock outcrops on north or partially north-facing slopes, or in moist canyon bottoms. The species is locally common to abundant in suitable habitats in the upper regions of Tassajara Creek, Church Creek, Miller's Canyon and Bear Basin. Elsewhere in the Tassajara region trees occur singularly or in small groves, such as in the upper regions of Oryoki Creek, in Pine Valley, in ravines south of the Pine Ridge Trail just beyond the first summit west of Tassajara Road, and a few scattered trees occur in the upper regions of Willow Creek and Calaboose Creek. The nearest trees to the hot springs occur in the Oryoki Creek drainage, with the highest tree of a small grove protruding above a ridge, making it visible from the developed area. *DISTRIBUTION*: endemic to the Santa Lucia Mountains of Monterey County and northwestern-most San Luis Obispo County. The northern terminus of distribution extends from the watershed of the Little Sur River to Chew's Ridge and vicinity in the upper Carmel River watershed (the northeastern-most stands are east of Tassajara Rd. in Anastasia Canyon and the upper regions of Calaboose Cr.). Southward, populations are scattered through the watersheds of the Big Sur, Arroyo Seco, San Antonio, and Nacimiento Rivers, and in numerous watersheds of smaller coastal streams which drain into the Pacific Ocean. The southern-most populations are located in the canyon of the Arroyo de la Cruz, in the far northwestern corner of San Luis Obispo County.

Abies bracteata is not only the rarest and most narrowly endemic of all extant fir species, it is also the most morphologically distinct, so much so that it is classified as the sole member of the subgenus *Pseudotorreya* (all other species belong to the subgenus *Abies*). The unique morphological features include the bracts subtending the cone scales, which are elongated into awl or pine needle-like formations 2 to 4 cm. long (the feature to which both *bracteata* and "bristle-cone fir" refer to), the large spindle-shaped and resinless winter twig buds, the sharply pointed leaves (which more closely resemble the leaves of *Torreya* of the Yew Family, and hence the subgeneric name), the very thin bark, and the sharply pointed spire-like crowns, which resemble the crowns of fir and spruce species of subalpine regions.

Fossil evidence from western Nevada dating to the Miocene period (about 13 million years ago) suggests that *Abies bracteata*

was formerly much more widely distributed in western North America (Axelrod '76). During the Miocene climatic conditions were warmer and much more mild than present conditions, and included regular summer rainfall. As the climate began to cool through the Pliocene period, leading to ice ages of the Pleistocene, it is likely that *A. bracteata* could not tolerate the colder and drier conditions, and thus became restricted to the more mild climates of coastal mountains. Likely causes for the extinction of *A. bracteata* outside of the Santa Lucia Mountains include the evolution of California's Mediterranean (dry summer) climate during the current post-glacial period (the Holocene), which started about 11,000 years ago (the climate is largely the result of the development of the cold-water California Current during the ice ages), and, perhaps, especially to what appears to have been an extremely xerothermic (hot-dry) period between about 4,000 and 8,000 years ago.

Based on the overall composition of plant specimens in the Miocene formations in which fossilized *A. bracteata* (*A. scherrii* Axelrod) were found, it appears that the species occupied a transitional habitat between a broadleafed evergreen (sclerophyll) forest and a forest of mixed conifers, similar to what *A. bracteata* now inhabits in the Santa Lucia Mts. Many of the fossilized plants were related to (if not the direct ancestors of) plants which are current associates of *A. bracteata*. Of the plants associated with the ancient broadleaf forest, specimens of *Quercus hannibalii* made up to 85% of the specimens in some of the formations. This species was very similar to the extant *Quercus chrysolepis* (Canyon Live Oak), the current overall dominant species on the middle and higher ridges on the Santa Lucia Mountains. Other extant broadleaf trees and shrubs which have counterparts in the deposits include *Arbutus*, *Lithocarpus*, *Quercus wislizenii*, *Acer*, *Cercocarpus*, *Ceanothus cuneatus*, *Heteromeles*, *Rhamnus californica*, *Platanus*, *Salix lasiolepis* and *Salix melanopsis*. Of the specimens associated with the ancient coniferous forest, two have living counterparts which currently exist in the Santa Lucia Mountains, *Pinus ponderosa* (Ponderosa Pine) and *Pseudotsuga menziesii* (Douglas Fir). Other conifers represented in the fossil-flora, which still have living counterparts, but not in the Santa Lucia Mountains, include *Sequoiadendron giganteum* (Giant Sequoia), *Pinus monticola*, *Abies concolor* (White Fir), *Abies magnifica* var. *shastensis*, and *Picea breweriana* (Weeping Spruce).

Abies bracteata shows a strong preference to two very dissimilar habitats: rocky slopes (or on or above cliffs), and deep, shady canyon bottoms. The one thing that these habitats have in common is that they are both relatively fire proof, an essential condition for the survival of *A. bracteata*, for the thin bark and dense crowns, which extend nearly to the base of the trees, make this species extremely vulnerable to fires, and fires are an inevitable phenomenon in this region. Although it is rare and restricted to fire-proof sites at higher and intermediate elevations of the Santa Lucia Mts., *Abies bracteata* is a reproductively vigorous species. Trees at all stages of maturation are regularly encountered, including innumerable seedlings, even during periods of prolonged drought.

PINUS. PINE.

About 94 species of the northern hemisphere.

1a. Cones mostly 7 to 15 cm. long. Mature trees seldom less than 100 ft. tall (and often much taller). Common from "The Caves" area to Pine Ridge and Pine Valley, and lightly scattered in some areas (rarely below 2,000 ft.). Apparently absent on the summit of Chew's Ridge. . . . . ***P. ponderosa.***

1b. Cones mostly 15 to 35 cm. long. Mature trees (locally) rarely as much as 100 ft. tall:

2a. Sharp tip at the apex of the cone scales slender and less than 3 cm. long. Restricted to two small plantations on the summit of Chew's Ridge. . . . . ***P. jeffreyi.***

2b. Sharp tip at the apex of the cone scales stout and 3 to 5 cm. long (and outwardly curved). Scattered nearly throughout the Tassajara region, and locally common to abundant in some areas. . . . . ***P. coulteri.***

Pinus coulteri D. Don. BIG-CONE PINE, COULTER PINE (p. 15). *HABIT*: evergreen trees with open-pyramidal or sometimes asymmetrical crowns ranging from about 12 to 25 m. (40-85') tall. *BARK*: blackish-brown and deeply fissured into scaly plates. *LEAVES*: grayish blue-green needles about 1.5 to 3 dm. long, which are produced in bundles of three's, and remain on the tree for about three or four years. *CONES*: large and heavy, about 20 to 35 cm. (8-14") long, and tending to remain on the tree for several years after the seeds have fallen. *SEEDS*: ellipsoid, about 12 to 18 mm. long, and with wings about 25 to 30 mm. long. *OCCURRENCE*: widely scattered in woodland habitats and sometimes in chaparral in the Tassajara region, commonly in small groups or as singular trees, but sometimes forming continuous stands covering many acres, such as in The Pines and on Chew's Ridge. *DISTRIBUTION*: south Coast Ranges, from Mt. Diablo southward, through the Transverse and Peninsular Ranges of southern California, to the mountains of northern Baja California (where the species occurs only at four known sites).

***Pinus jeffreyi** Greville & Balfour. JEFFREY PINE (p. 16). *HABIT*: evergreen trees typically with long and narrow crowns ranging from about 20 to 53 m. (65-175') tall. *BARK*: generally reddish-brown and deeply furrowed. *LEAVES*: about 15 to 22 cm. long, bluish-green, and produced in bundles of three's. *CONES*: about 15 to 25 cm. long. *SEEDS*: about 10 to 13 mm. long, with wings about 3 cm. long. *OCCURRENCE*: limited to two groves on Chew's Ridge, one to the north of the lookout and the other southwest of the lookout (along the road to the MIRA Observatory). The groves were planted by the U. S. Forest Service in the winter of 1909 (re., *Salinas Daily Index*: "Jamesburg Gleanings," 1.20.'09 and "Forest Ranger is Shut Out of Home," 1.29.'09, Sloan '14, Zoble '53, Griffin '75). *DISTRIBUTION*: Coast Ranges, from southwestern Oregon to Lake and Colusa Counties, and from Mono Co. southward through the Sierra Nevada, to the higher elevations of the Tehachapi, Transverse and Peninsular Ranges of southern California and northern Baja California, with a disjunct population on San Benito Mt. of southern San Benito Co. and western Fresno Co. *NOTE*: Zobel noted that some of the trees on Chew's Ridge exhibit characteristics suggesting hybridization between *P. jeffreyi* and *P. coulteri*. As one of such trees noted by Zobel was of older age (i.e., planted prior to the Miller Canyon Fire of 1928), its seed must have been included with those used for the establishment of the plantations.

Pinus ponderosa Douglas ex P. & C. Lawson. PONDEROSA PINE, WESTERN YELLOW PINE (p. 16). *HABIT*: evergreen trees typically with narrow and fairly open crowns ranging from about 30 to 43 m. (100-140') tall, with larger trees ranging upward to about 70 m. (230') tall. The trunks can be as much as 2.5 m. (8'+) in diameter. *BARK*: reddish to yellowish-brown, broken into large shield-like plates, and covered with small scales that some-what resemble the pieces of a jigsaw puzzle. The scales flake away, leaving sulfur-yellow depressions on the plates. *LEAVES*: deep yellow-green needles about 12 to 25 cm. long, and that are produced in bundles of three's. *CONES*: mostly about 7 to 15 cm. long, and rather light in relationship to the size. *SEEDS*: generally ovoid and about 6 or 7 mm. long, with wings about 24 to 30 mm. long. *OCCURRENCE*: forming a nearly continuous stand

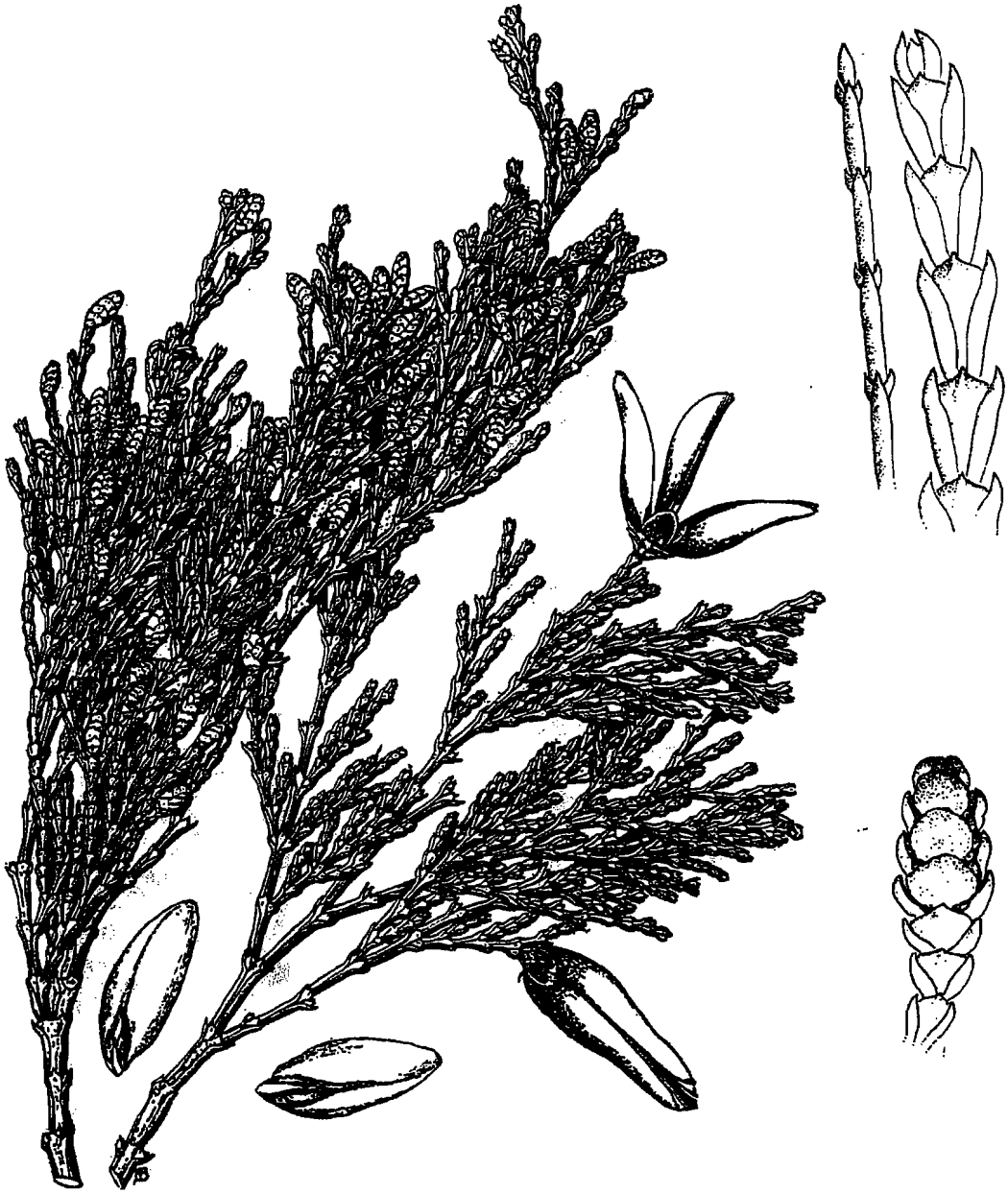
from the upper regions of Church Creek northward to Miller Ridge and Pine Valley, and westward to Pine Ridge and Bear Basin. Also scattered in the upper regions of Tassajara Creek, Miller Canyon, and on Chew's Ridge. *DISTRIBUTION*: the most widespread and abundant pine in the mountains of western North America, ranging from British Columbia to the mountains of northern Baja California and central Mexico. Trees of the Pacific slope are generally much larger than those of interior populations.

Notes on *Pinophyta*.

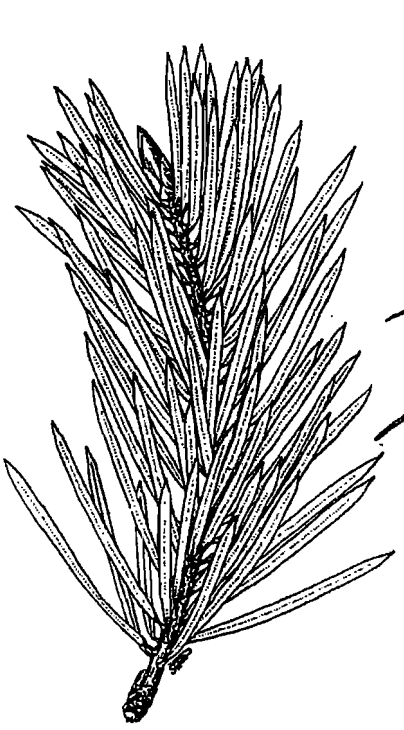
In the winter of 1983-1984 perhaps as many as 1,000 seedlings of *Pinus coulteri* were planted (under the direction of Paul Discoe) on mountains slopes a short distance south-southwest of Tassajara Hot Springs. Probably because only a fraction of normal rainfall fell after the trees were planted, few (if any) survived.

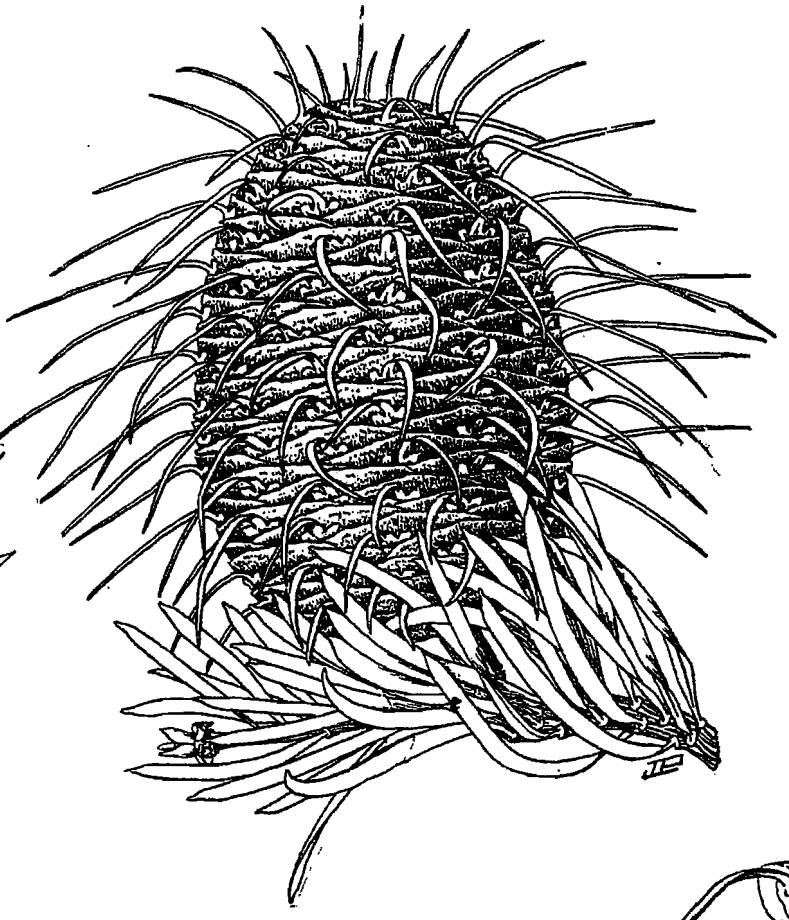
A planted cypress tree is present in a bend in Tassajara Road formed by the second hairpin turn (above the last crossing of Cabarga Creek) as one is leaving Tassajara Hot Springs (about 1½ miles north of the hot springs). It appears to be the same species and about the same age as those planted in the developed area of the hot springs, and probably represents *Cupressus arizonica*.

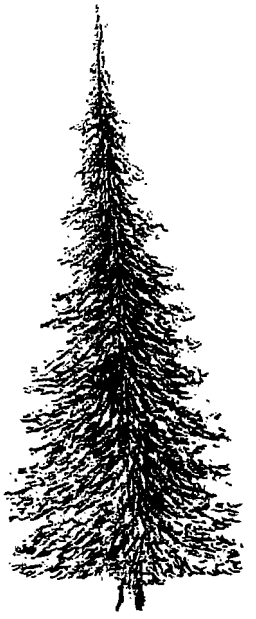
Native coniferous trees located in areas of the Santa Lucia mountains near to the Tassajara region include *Sequoia sempervirens* (Coast Redwood, in the Big Sur River watershed), *Pinus attenuata* (Knobcone Pine, on the ridge between Strawberry and Indian Valleys), and *Pinus lambertiana* (Sugar Pine, on Cone and Junipero Serra Peaks).

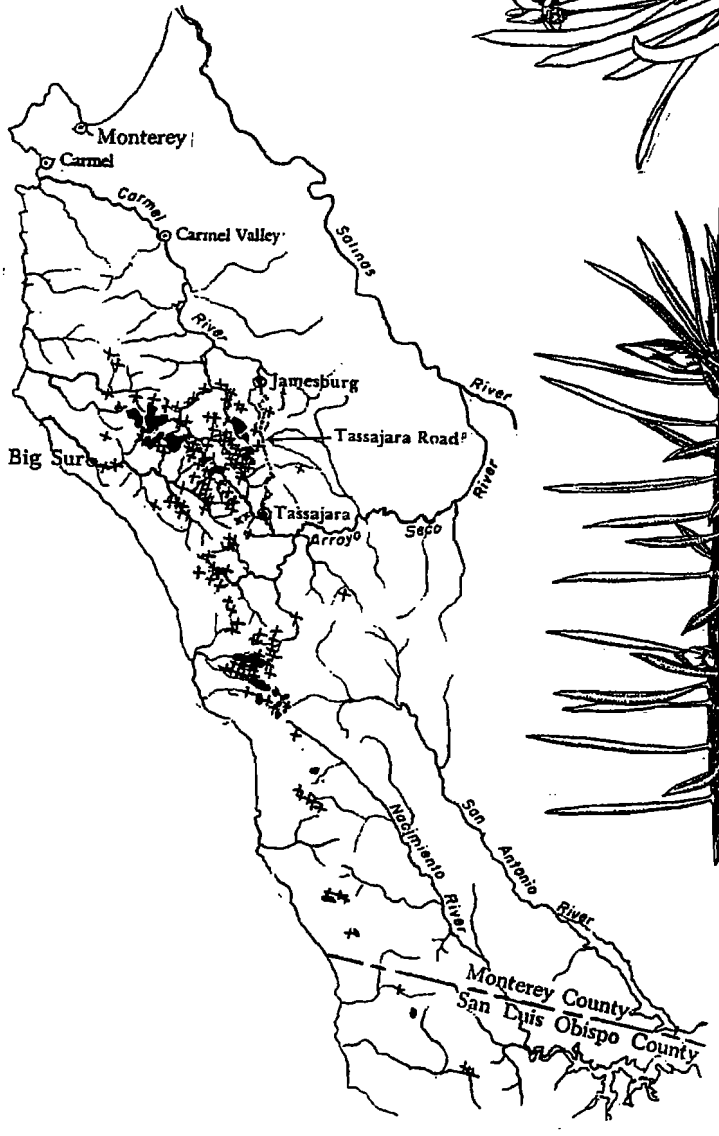


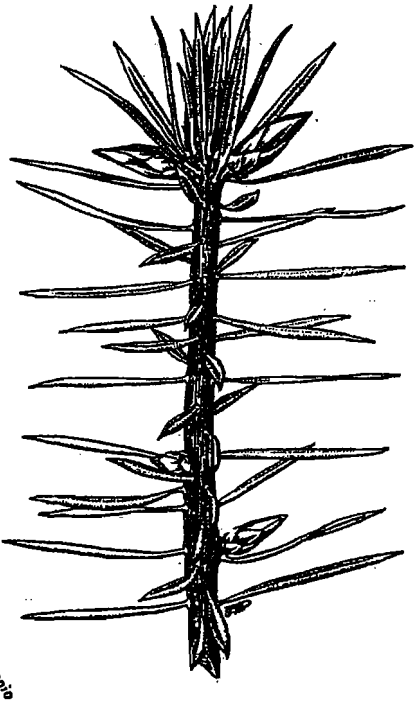
Calocedrus decurrens

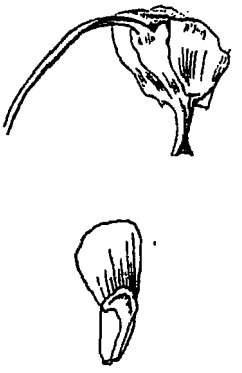




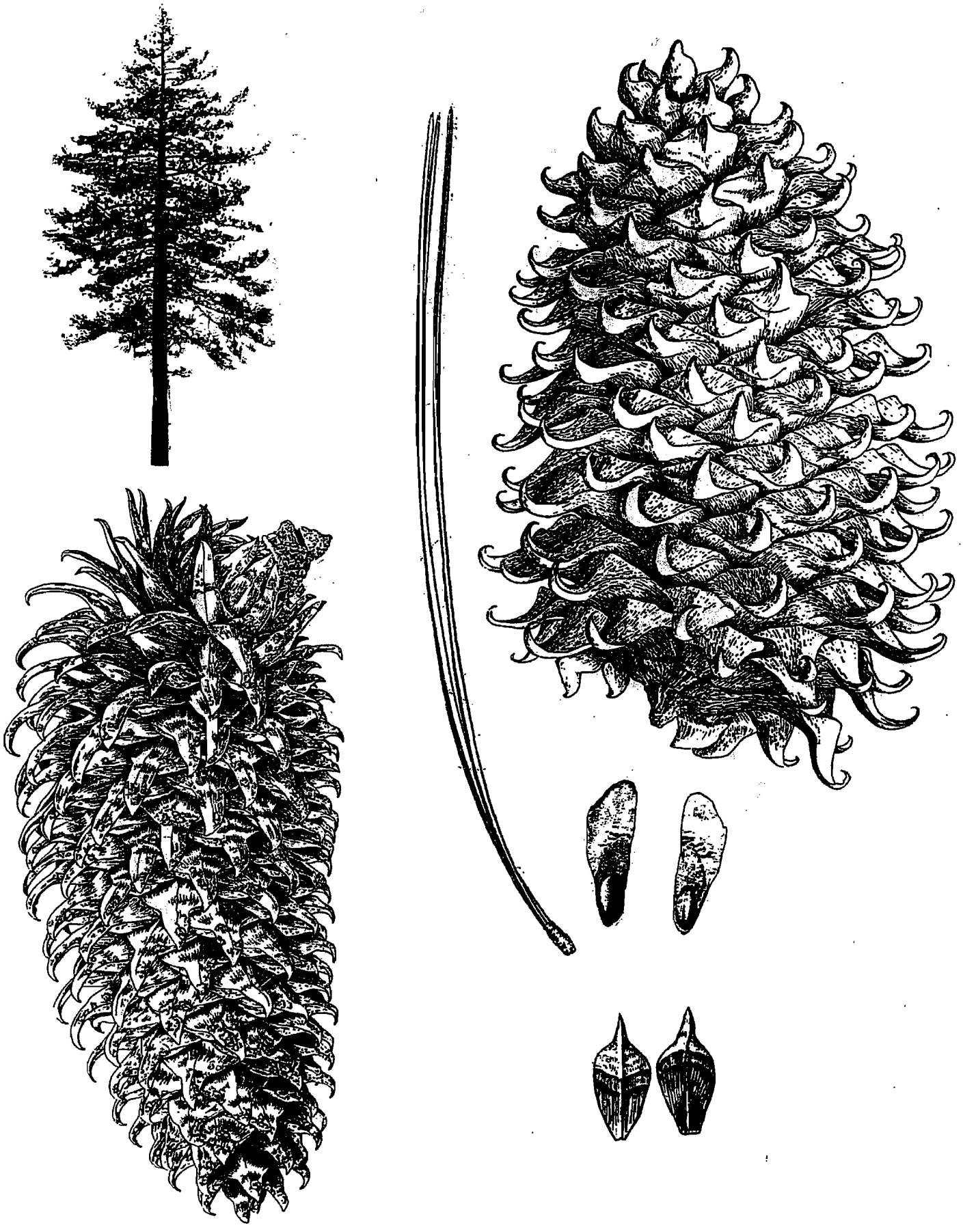




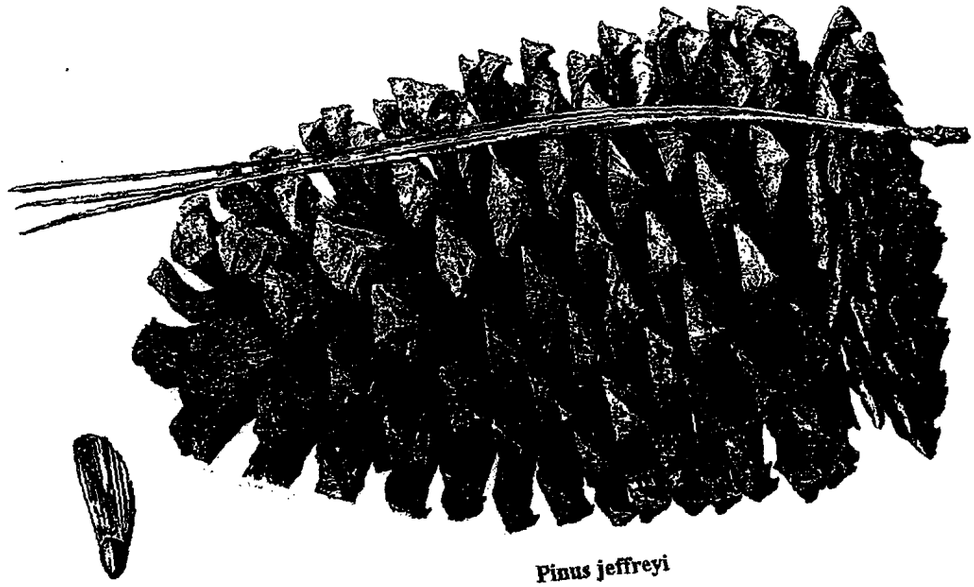




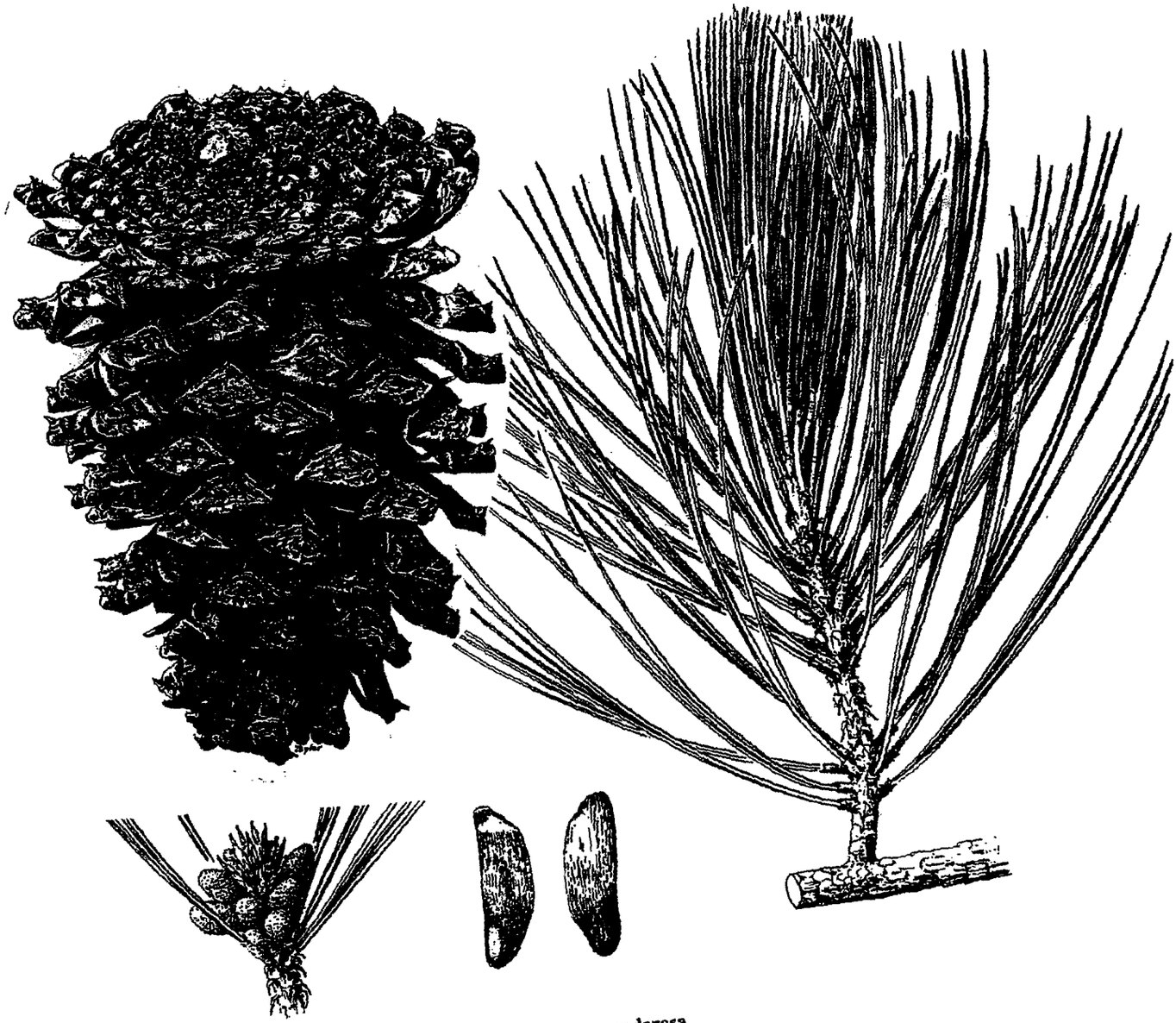
Abies bracteata



Pinus coulteri



Pinus jeffreyi



Pinus ponderosa

ANTHOPHYTA (Angiospermae). FLOWERING PLANTS.

With approximately 440 families, 12,615 genera and 235,000 species (Thorne '92), *Anthophyta* is by far the largest division of vascular plants, and in the present epoch it represents about 70% of all plant species, and about 95% of all terrestrial vascular plant species. Flowering plants are divided into two classes, *Dicotyledoneae* (dicotyledons or dicots) and *Monocotyledoneae* (monocotyledons or monocots), with the *Dicotyledoneae* representing about 71% of the taxa and the *Monocotyledoneae* about 29% of the taxa. As the taxa of *Monocotyledoneae* are most diversified in tropical regions, the ratio between the classes in temperate regions even more strongly in favor of the *Dicotyledoneae* (in the Tassajara region the ratio is about 83% dicot and 17% monocot).

Flowers most typically consist of a central axis (receptacle) and four series of parts: pistils, stamens, calyces and corollas. The first two are the primary series, and all flowers have at least one or the other, and usually both. **Pistils** are the pollen receiving and seed producing (thus female) organs of a flower, and typically consist of a basal ovary, which contains seed producing ovules, a usually elongated stem, known as a style, and a pollen receiving and usually terminal stigma. The stigma transmits the pollen to the ovary, where fertilization occurs. **Stamens** are the pollen emitting (thus male) organs of a flower, and are typically comprised of and elongated stem, known as a filament, and a pollen-bearing and usually expanded terminal structure that is known as an anther. The flowers of most flowering plant species have both stamens and pistils, and are thus perfect (bisexual). Plant species in which an individual plant produces separate staminate and pistillate flowers are monoecious, while plant species in which an individual plant produces only staminate or pistillate flowers are dioecious. The **calyx** is the outer structure of a flower, and when divided to or nearly to the base, the individual segments are known as sepals. Calyces are usually green, but can vary from colorful and delicately textured to dry and/or husk-like formations. The **corolla** is the inner and usually colorful and delicately textured structure of a flower, but in some species it can be green and calyx-like or dry and chaffy. When the corolla is divided to or nearly to the base, the individual segments are known as petals. Both the calyx and corolla can be greatly modified or entirely absent in many species.

1a. Germinating embryos with two opposing cotyledons (generally leaf-like and often food-supplying structures). Leaves most commonly not grass-like, and typically with a pinnately or palmately branched vein structure, with capillary veins netted between the larger veins. Trunks or branches of tree or shrub species becoming truly woody and developing true bark, the wood developing concentric rings with each year's growth, and thus widening the girth. Outer flower parts (calyces & corollas), if present, are mostly lobed or divided in four's, five's, or more. Broadleaf trees, shrubs, and innumerable perennial and annual herbaceous plants. . . . . ***DICOTYLEDONEAE.***

1b. Germinating embryos with one cotyledon. Leaves most typically elongated and more or less grass-like, and with a parallel vein structure. Outer flower parts (perianth segments) are singular, dual, or arranged in one or more series of three's. Trunks or branches of tree or shrub-like plants are not truly woody and do not develop true bark, the "wood" is either fibrous and/or pithy and does not develop growth rings (such as in palm, banana, and Joshua trees), or is hard and tubular in shape, and solid only at the nodes (as in the bamboos of the Grass Family). Grasses, sedges, rushes, cat tails, lilies, orchids, irises, etc. . . . . ***MONOCOTYLEDONEAE.***

ANTHOPHYTA, Class DICOTYLEDONEAE. DICOTYLEDONS.

As enumerated by Thorne ('92), *Dicotyledoneae* is comprised of about 353 families, 9,074 genera and approximately 166,832 species, and thus represents about 71% of all species of flowering plants.

1a. Flowers sessile on a common receptacle bearing few to usually many (and often minute) flowers (a flower-head), the receptacle usually surrounded by one or more whorls of involucre bracts (phyllaries). Ovaries inferior and commonly crested with scale or bristle-like calyx segments (pappus), the corolla either tubular at the base and strap-like above (a ray or ligulate flower) or tubular and entire or lobed at the apex (a tubular or discoid flower). Heads may be comprised entirely of ray flowers (a ligulate head), entirely of tubular flowers (a discoid head), or of both ray and tubular flowers (a radiate head), with the former situated at or near the parameters of the receptacle and resembling free petals. Anthers united into a tube surrounding the style. . . . . ***ASTERACEAE.***

1b. Flowers not or not in most aspects like the above (if produced from a common involucre, then the are flowers pediceled, the ovary is superior, and the corollas are not tubular):

2a. Corollas absent. Calyces (if present) usually green, but may be petal-like in color and texture in some species. . . . . **GROUP ONE.**

2b. Corollas present:

3a. Corollas divided to the base into distinct petals, or some petals free and others united or partly united. . . . . **GROUP TWO.**

3b. Corollas united, at least at the base. . . . . **GROUP THREE.**

GROUP ONE. COROLLAS ABSENT.

1a. Parasitic herbs or shrubs which occur only on the branches or stems of trees. . . . . ***Viscaceae.***

1b. Non-parasitic plants:

2a. Herbaceous plants, or if somewhat woody, then vine-like or woody only near the base:

3a. Leaves divided into five or more distinct and petiolate leaflets. Pistils 7 to 100, stamens 15 to 100. Semi-woody vines or perennial herbs of wet habitats. . . . . ***Ranunculaceae*** (*Clematis* and *Thalictrum*).

3b. Leaves mostly simple, but if deeply divided, then the lobes or leaflets are not petiolate. Pistils 1 (the styles 1 to 3), stamens 2 to 12. Annual or perennial herbs or subshrubs of dry or wet habitats, and if vine-like, then a delicate annual herb:

4a. Delicate and vine-like annual herbs with weak and generally prostrate stems. Leaves opposite, obcordate (heart-shaped) to fan-shaped or roundish. . . . . ***Polygonaceae*** (*Pterostegia*).

4b. Annual or perennial herbs or subshrubs, the stems not prostrate, or if so, then not weak or vine-like. Leaves opposite, alternate or whorled, of various shapes, but not obcordate:

Key to Dicotyledoneae

5a. Flowers subtended by an involucre. Calyces and sometimes the involucre petal-like in color and texture. . . . . ***Polygonaceae*** (*Eriogonum & Chorizanthe*).

5b. Flowers not subtended by an involucre, or if so, then the flowers are without a calyx. Calyces, if present, not petal-like in color or texture:

6a. Stems with a sheath-like structure at the leaf nodes. . . . . ***Polygonaceae*** (*Rumex & Polygonum*).

6b. Stems without sheath-like structures:

7a. Larger leaves pinnately divided or lobed. Ovaries inferior or superior:

8a. Perennial herbs with erect or ascending stems ranging from about 7 to 10 dm. (28-72") tall. Ovaries inferior. . . . . ***Datiscaceae***.

8b. Annual herbs with prostrate or ascending stems ranging from about .5 to 2 dm. (2-8") long. Ovaries superior. . . . . ***Brassicaceae*** (*Lipidium*).

7b. Leaves entire or toothed, but not pinnately or deeply divided. Ovaries superior:

9a. All leaves opposite. Plants with needle-like hairs that inflict a painful and chemically-induced sting when touched. Nettles. . . . . ***Urticaceae***.

9b. Leaves alternate or mostly alternate (upper leaves may be opposite or in 3's). Plants without stinging hairs (hairs, if present, may be bristly):

10a. Stamens 5. Styles 2 or the style 2-cleft at the apex. . . . . ***Chenopodiaceae***.

10b. Stamens 1 or 6 to 10. Styles 1 or 3 (if 3, then each 2-cleft). . . . . ***Euphorbiaceae***.

2b. Trees and shrubs:

11a. Plants of riparian habitats, i.e., plants of streambanks, springs, seeps, etc.:

12a. Bark off-white, becoming grayish with age, and flaking off in thin scales. Leaves large, generally deltate in outline, and palmately divided into three to five-lobes. Sycamore trees. . . . . ***Platanaceae***.

12b. Bark light to dark gray or brown, and not flaking off in thin scales. Leaves various, but not palmately lobed:

13a. Leaves oblong-ovate to rhombic and with doubly serrate margins. The fruit is a small and woody cone-like structure that produces winged nutlets. Alder trees. . . . . ***Betulaceae***.

13b. Leaves deltate to narrowly linear, the margins entire, finely serrate or crenate, or sometimes irregularly lobed. The fruit is a capsule that produces seeds which are equipped with tufts of fine hairs which enable them to be carried by the wind. Willows and Cottonwood trees. . . . . ***Salicaceae***.

11b. Plants of various non-riparian habitats (or only incidentally occurring in riparian habitats):

14a. Leaves strongly aromatic, with a distinct spicy scent and taste. Sepals 6 to 8 mm. long, yellow or yellowish, and resembling a corolla. The fruit is a fleshy drupe with a thin green skin, oily flesh, and a stone like seed, and thus resembling a small avocado. . . . ***Lauraceae***.

14b. Leaves not or not strongly aromatic. Sepals, if present, less than 6 mm. long, and not resembling a corolla, except in *Polygonaceae*. Fruits of various kinds, but if a drupe, then juicy and berry-like:

15a. Flowers produced in catkins or the staminate flowers produced in catkins:

16a. Monoecious trees or shrubs, i.e., each plant produces both staminate and pistillate flowers. Staminate flowers produced in non-silky catkins and pistillate flowers produced in axillary clusters (*Quercus*), or the flowers produced in both staminate and pistillate catkins (*Lithocarpus*). The fruit is an acorn. Oaks and Tanoaks. . . . . ***Fagaceae***.

16b. Dioecious shrubs (i.e., the flowers of an individual plant are staminate or pistillate, but never both). All flowers produced in catkins, which are covered with a dense coat of silky hairs. The fruit is a berry. . . . . ***Garryaceae***.

15b. Flowers not produced in catkins:

17a. Tufted shrubs or sub-shrubs less than 2 m. (6.5') tall. Leaves narrowly linear, less than 2 cm. long, and with entire and revolute margins. Calyces petal-like in color and texture. . . . . ***Polygonaceae*** (*Eriogonum fasciculatum*).

17b. Shrubs ranging from about 1.5 to 8 m. (5-26') tall. Leaves roundish to ovate, obovate or elliptic, about 1 to 8 cm. long, and with serrate or spiny-toothed margins. Calyces not petal-like in color or texture:

18a. Leaves elliptic to obovate with serrate margins, and up to 8 cm. long. The fruit is an akene with a persistent and feather-like style, and that is enclosed in a persistent floral tube. . . . . ***Rosaceae*** (*Cercocarpus*).

18b. Leaves roundish to ovate with spiny-toothed margins, and less than 4 cm. long. The fruit is a red berry containing two seeds. . . . . ***Rhamnaceae*** (*Rhamnus ilicifolia*).

GROUP TWO: COROLLAS DIVIDED INTO PETALS.

PETALS UNEQUAL IN SIZE, SHAPE OR ARRANGEMENT.

1a. Trees or large shrubs generally 3 to 10 m. (10 to 32') tall. Leaves opposite and palmately divided into 5 to 7 leaflets about 5 to 15 cm. long. Flowers many in conical to oblong panicles about 1 to 2 dm. long, the petals white. The fruit is a large pear-shaped capsule with one seed about 2 to 5 cm. wide. . . . . ***Hippocastanaceae***.

1b. Shrubs, subshrubs or herbs (locally) rarely more than 2 m. tall. Leaves various, and if palmately divided, then alternate and with leaflets mostly less than 5 cm. long. Inflorescence and fruits various, but not like the above:

2a. Petals 4 in two unequal sets, the outer petals united at the base, the inner petals are united at the tip. Stamens 6. . . . . ***Papaveraceae*** (*Dicentra*).

2b. Petals 3 to 5, none united at the tip. Stamens 5, 6 to 8, or 10 or more:

3a. Stamens 5. Petals 5, the arrangement with two upper, two lateral and one lower, the lower spurred at the base. The fruit is a 3 chambered capsule. . . . . ***Violaceae***.

3b. Stamens 6 or more. Petals 3 to 5, and spurred only in *Ranunculaceae*. The fruit is a capsule, legume or follicle:

4a. Flowers with one or five nectar-bearing spurs, and with sepals that are petal-like in color and texture. Stamens 10 or more, the filaments mostly free. Pistils 3 to 5. . . . . ***Ranunculaceae***.

4b. Flowers without spurs, the sepals not petal-like (except in *Polygalaceae*). Stamens 6 to 10, the filaments usually fused. Pistil singular. The fruit is a capsule or legume. Lower petal or petals obscuring or engulfing the stamens and pistil:

5a. Leaves simple. Stamens 6 to 8. Petals 3 or 5 or absent. Petal arrangement with two small upper petals, two large lateral petals (actually modified sepals) and one lower and sack-like petal. The fruit is a two-chambered capsule. . . . . ***Polygalaceae.***

5b. Leaves divided into 3 or more leaflets. Stamens 10. Petals 5, the arrangement papilionaceous (butterfly-like), with 1 upper and usually larger petal (banner), 2 lateral petals (wings), and 2 central petals (the keel), which are often united or partly united, and are typically obscured by the wings. The fruit is a 1 to many seeded legume (pod). . . . . ***Fabaceae.***

PETALS EQUAL OR NEARLY EQUAL IN SIZE, SHAPE OR ARRANGEMENT.

TREES, SHRUBS AND SUBSHRUBS.

1a. Plants with well developed thorns or spines. Petals 5:

2a. Stamens 10 to many. Ovaries superior, the fruit an aggregation of drupelets (blackberry) or akenes hidden within an enlarged hypanthium (rose hip). . . . . ***Rosaceae*** (*Rosa & Rubus*).

2b. Stamens 5. Ovaries inferior, the fruit a spiny berry. . . . . ***Grossulariaceae.***

1b. Plants not thorny (plants may have spinescent branchlets or prickly hairs). Petals 4, 5 or 6:

3a. Ovaries inferior or partially inferior (positioned below or partially below and to some extent connected to the calyx, at least near the base):

4a. Flowers with more stamens than petals:

5a. Shrubs with alternate leaves. The fruit a red & waxy or black & berry-like pome (an apple-like fruit). . . . . ***Rosaceae*** (*Heteromeles & Amelanchier*).

5b. Subshrubs with opposite leaves or with at least some of the leaves opposite. The fruit is a dry capsule:

6a. Plants with erect or ascending branches. Flowers elongated and with a red and corolla-like tube about 2 to 4 cm. long. Petals red. Seeds crested with tufts of hair. . . . . ***Onagraceae*** (*Epilobium canum*).

6b. Plants with semi-prostrate branches. Flowers not elongated and less than 1 cm. long. Petals white. Seeds without tufts of hair. . . . . ***Philadelphaceae*** (*Whipplea*).

4b. Flowers with the same number of stamens as petals:

7a. Leaves opposite or in opposite groups or clusters. Petals and stamens 4. . . . . ***Cornaceae.***

7b. Leaves alternate or in alternate groups or clusters, except in some *Rhamnaceae* species (locally *Ceanothus cuneatus*). Petals and stamens sometimes 4 but usually 5:

8a. Petals and stamens 5, the stamens alternate with the petals. Ovaries completely inferior. The fruit is a berry. . . . . ***Grossulariaceae.***

8b. Petals and stamens 4 or 5, the stamens opposite the petals. Ovaries only partially inferior. The fruit is a dry capsule or berry. . . . . ***Rhamnaceae.***

3b. Ovaries superior (positioned above and not connected to the calyx, but the calyx may surround the ovary):

9a. Stamens 10 or more:

8a. Plants vine-like. Leaves divided into 3 to 15 leaflets. True petals absent, but simulated by four sepals that are petal-like in color and texture. . . . . ***Ranunculaceae*** (*Clematis*).

8b. Shrubs or subshrubs. Leaves simple. True petals present:

10a. Shrubs:

11a. Sepals 2, petals 4. The fruit is a slender capsule. . . . . ***Papaveraceae*** (*Dendromecon*).

11b. Sepals and petals 5. Fruit is an akene, drupe or follicle. . . . . ***Rosaceae.***

10b. Tufted subshrubs or woody-based perennial herbs:

12a. Leaves mostly alternate and narrowly linear. Petals yellow. . . . . ***Cistaceae.***

12b. Leaves opposite and ovate to obovate or oblanceolate. Petals red. . . . . ***Caryophyllaceae*** (*Silene*).

9b. Stamens less than 10:

13a. True petals absent, but simulated by 6 sepals that are petal-like in color and texture. Leaves strongly and generally pleasantly aromatic. The fruit is a green and oily drupe with one large seed. . . . . ***Lauraceae.***

13b. True petals present. The leaves not strongly or pleasantly aromatic. Fruits various, but not like the above:

14a. Leaves whorled in 4's. Calyx absent, petals 4. The fruit is a berry or 2 nutlets. . . . . ***Rubiaceae.***

14a. Leaves alternate or opposite, but not whorled in 4's. Calyx present, petals 2 to 6. The fruit is a berry, winged nutlet, capsule or elongated pod:

15a. Leaves divided into 3 or more leaflets:

16a. Leaves divided into 3 (or rarely 5) leaflets. The fruits are greenish or whitish berries. Contact with surface oils causing a severe allergenic dermatitis in most people. Poison Oak. . . . . ***Anacardiaceae.***

16b. Leaves divided into more than 3 leaflets:

17a. Leaflets with spiny-toothed margins. Petals 6. The fruit is a berry. . . . . ***Berberidaceae.***

17b. Leaflets with serrate but not spiny-toothed margins. Petals 2. The fruit is double samara (2 winged nutlets). . . . . ***Oleaceae.***

15b. Leaves simple or lobed, but not divided into leaflets:

18a. Trees. Leaves opposite, deltate to roundish in outline, about 1 to 4 dm. (4-16") in diameter, and deeply divided into 5 (or sometimes 3) major lobes. The fruit is double samara (2 winged nutlets). . . . . ***Aceraceae.***

18b. Subshrubs. Leaves much smaller and not lobed:

19a. Petals 4. The fruit is a well exserted silique. . . . . ***Brassicaceae.***

19b. Petals 4 to 6. The fruit is capsule that is obscured within a tubular calyx. . . . . ***Lythraceae.***

PETALS EQUAL OR NEARLY EQUAL IN SIZE, SHAPE OR ARRANGEMENT.

ANNUAL AND PERENNIAL HERBS.

1a. Ovaries inferior or partially inferior (positioned below or partially below and to some extent connected to the calyx, at least near the base):
2a. Leaves one or more times pinnately, ternately, or palmately divided into distinct leaflets or narrow segments. Flowers produced in simple or compound umbels:
3a. Umbels simple or compound, but the inflorescence not paniculate. The fruit is dry, often prickly or bristly, and splitting into two carpels in maturity. . . . . ***Apiaceae.***
3b. Umbels produced on the branches of a panicle. The fruit is a berry. . . . . ***Araliaceae.***
2b. Leaves simple to pinnately or palmately toothed or lobed, but not divided into distinct leaflets or narrow segments. Flowers not produced in umbels:
4a. Styles 2 to 5, or the style two-cleft nearly to the ovary:
5a. Cauline leaves alternate or leaves strictly basal. . . . . ***Saxifragaceae.***
5b. Cauline leaves opposite. . . . . ***Philadelphaceae.***
4b. Style singular (the stigma may be lobed):
6a. Flowers with 4 sepals, 4 petals, and 4 or 8 stamens. The fruit is a 4 celled capsule. . . . . ***Onagraceae.***
6b. Flowers with 5 sepals, 5 to 10 petals, and 10 or more stamens. The fruit is a 1-celled capsule. . . . . ***Loasaceae.***
1b. Ovaries superior (positioned above and not connected to the calyx, but the calyx may surround the ovary):
8a. Stamens 10 or more:
9a. Pistils 3 to many, each maturing into an akene or a follicle:
10a. Leaves simple and very succulent. The fruit is a follicle. . . . . ***Crassulaceae.***
10a. Leaves variously lobed or divided into leaflets, these not or only slightly succulent. The fruit is a follicle or akene:
11a. Flowers with a hypanthium (a generally cup-shaped structure from which the calyx, corolla and stamens arise). Petals and sepals symmetrical, the sepals green and not petal-like. The fruit is an akene. . . . . ***Rosaceae.***
11b. Flowers without a hypanthium. Petals and sepals symmetrical or asymmetrical, the sepals in *Delphinium*, *Aquilegia*, and *Clematis* petal-like in color and texture. The fruit is a follicle or akene. . . . . ***Ranunculaceae.***
9b. Pistils 1, remaining intact or dividing into few to many carpels in maturity (the styles may be one to several and entire or divided):
12a. Cauline leaves opposite or whorled or some cauline leaves opposite or whorled:
13a. Leaves palmately divided into deep lobes or segments. The fruit is comprised of 5 carpels, each of which retains longitudinal section of the style. . . . . ***Geraniaceae*** (*Geranium*).
13b. Leaves simple. The fruit is a capsule:
14a. Plants of wet habitats. Petals entire and yellow with black dots. Stamens usually much more than 10. . . . . ***Hypericaceae.***
14b. Plant of various habitats, but not of wet ones. Petals lobed or entire, not yellow, or if yellowish, then lobed and not black-dotted. Stamens 10:
15a. Leaves opposite. Petals lobed (except in *Minuartia & Moehringia*). Annual and perennial herbs. . . . . ***Caryophyllaceae.***
15b. Leaves whorled, opposite and often alternate. Petals entire. Perennial herbs. . . . . ***Ericaceae*** (*Chimaphila*).
12b. Cauline leaves alternate (basal leaves may be in rosettes), or the leaves strictly basal:
16a. Fruits comprised of 5 to 15 one-ovuled carpels. . . . . ***Malvaceae.***
16b. Fruit a capsule:
17a. Leaves clover-like, i.e., divided into 3 generally obcordate leaflets. . . . . ***Oxalidaceae.***
17b. Leaves not clover-like, the blades ranging from simple to palmately lobed or deeply cleft, or ternately divided into numerous narrowly linear segments:
18a. Sepals 2. Petals 3 to 7:
19a. Leaves simple and entire. Sepals persistent. Petals 3 to 7 and red to pinkish. . . . . ***Portulacaceae*** (*Calandrinia*).
19b. Leaves divided into narrowly linear segments. Sepals falling early, usually before the flowers are mature. Petals 4 and yellow to orangish. . . . . ***Papaveraceae.***
18b. Sepals (or calyx lobes) 5. Petals 5:
20a. Sepals (or calyx lobes) equal or nearly equal in size and arrangement. Petals white. . . . . ***Saxifragaceae.***
20b. Sepals asymmetrical (1 large, 2 intermediate, and 2 minute and bract-like). Petals yellow. . . . . ***Cistaceae.***
8b. Flowers with less than 10 stamens:
21a. Cauline leaves opposite or whorled, or at least some of the cauline leaves opposite or whorled:
22a. Pistils 3 to 5, the fruit is a follicle. Annual less than 6 cm. (2½") tall and with leaves less than 3 mm. long. . . ***Crassulaceae*** (*Crassula*).
22b. Pistils 1, the fruit of various manifestations. Plants generally more to much more than 6 cm tall, the leaves generally more to much more than 3 cm. long:
23a. Sepals 2. Cauline leaves fused on one or both sides of the stem into disk-like or 2-lobed formations. . . . ***Portulacaceae*** (*Claytonia*).
23b. Sepals 3 to 6 (or absent). Cauline leaves not or only slightly fused at the base:
24a. Leaves divided into deep lobes or segments. The fruit is comprised of 5 carpels, each of which retains longitudinal section of the style (the style becoming coiled when dry). . . . . ***Geraniaceae*** (*Erodium*).
24b. Leaves simple, entire or toothed, but not deeply divided into lobes or segments:
25a. All or some of the leaves produced in whorls:
26a. Lower cauline leaves whorled, the basal in rosettes and the upper opposite. Sepals 3, petals 5. The fruit is a narrow capsule. Small annual herbs. . . . . ***Papaveraceae*** (*Meconella*).
26b. All leaves whorled. Sepals absent, petals 5. The fruit is 1 berry or 2 nutlets. Annual and perennial herbs. . . . . ***Rubiaceae.***
25b. All leaves opposite or some leaves opposite and others alternate:
27a. All leaves opposite. Sepals, petals and stamens 5. . . . . ***Caryophyllaceae.***

27b. Lower leaves generally opposite and the upper leaves generally alternate. Sepals and petals 4 to 6, stamens 6. . . . . ***Lythraceae***.

21b. Cauline leaves alternate or the leaves strictly basal:

28a. Pistils 2 to many, the fruit is an akene. . . . . ***Ranunculaceae*** (*Ranunculus hebecarpus*).

28b. Pistil 1:

29a. Sepals 2. . . . . ***Portulacaceae***.

29b. Sepals 4 to 15:

30a. Sepals and petals 4. Stamens 6, 4 long and 2 short (or rarely with only 2 or 4 stamens). The fruit is a 1 to many seeded, generally flattened, and often pod-like capsule. . . . . ***Brassicaceae***.

30b. Sepals 5 to 16, petals 5 or 6. Stamens 5 or 6:

31a. Sepals 9 to 16, petals 6, stamens 6. Leaves basal and biternately divided into leaflets. . . . . ***Berberidaceae***.

31a. Sepals, petals and stamens 5. Leaves basal or cauline and simple and entire:

32a. Leaves strictly basal, 4 to 14 cm. long, the blades generally ovate-lanceolate. Flowers singular and terminal on scapes. . . . . ***Saxifragaceae*** (*Parnassia*).

32b. Leaves cauline, narrowly linear, and 1 to 2.5 cm. long. Flowers produced in open cymes. . . . . ***Linaceae***.

GROUP THREE: COROLLAS UNITED.

1a. Parasitic plants. As the plants lack chlorophyll, they are not green. Leaves absent:

2a. Partially sub-terrestrial plants which are parasitic on the roots of other plants. Plants black to yellowish or purplish blue. Corollas bilabiate, 1 to 3 cm. long, and, in most species, more or less conspicuous. . . . . ***Orobanchaceae***.

2b. Non-terrestrial vines that are parasitic on stems and branches. Plants yellow to orangish. Corollas urn-shaped, less than 6 mm. long, and fairly inconspicuous. . . . . ***Cuscutaceae***.

1b. Non-parasitic (or not entirely parasitic) plants with chlorophyll, and thus green or generally green. Leaves present:

3a. Trees, shrubs and subshrubs (sometimes vine-like):

4a. Stamens 6 or more:

5a. Trees or shrubs with smooth reddish bark. Corollas urn-shaped and white or white with a pink tinge. The fruit is a roundish berry or drupe. . . . . ***Ericaceae***.

5b. Subshrubs. What may at first appear to be a tubular corolla is actually an elongated floral tube with four distinct petals inserted towards the mouth. The floral tube and petals are red. The fruit is a narrow capsule. . . . . ***Onagraceae*** (*Epilobium canum*).

4b. Stamens 5 or less:

6a. Ovaries inferior (positioned below or partly below the calyx, and wholly or at least partially connected to the calyx):

7a. Leaves opposite. Calyx present. Corolla 5 lobed or bilabiate with the upper lip 4 lobed and the lower lip 1 lobed. The fruit is a berry or drupe. . . . . ***Caprifoliaceae***.

7b. Leaves produced in whorls of 4 to 8. Calyx absent. Corolla 4 lobed. The fruit is a berry or 2 nutlets. . . . . ***Rubiaceae***.

6a. Ovaries superior (positioned above the calyx, and in no way united to the calyx):

8a. Corolla strongly to weakly bilabiate, the upper lip generally 2 lobed and the lower lip generally 3 lobed:

9a. Fruit comprised of 4 nutlets. . . . . ***Lamiaceae***.

9b. Fruit comprised of a few to many seeded capsule. . . . . ***Scrophulariaceae***.

8b. Corolla not bilabiate, the lobes of equal size and shape:

10a. Corolla rotate to slightly bowl-shaped. The fruit is a berry. . . . . ***Solanaceae***.

10b. Corolla bowl-shaped to salverform. The fruit is a capsule:

11a. Flowers produced in coiling cymes. Ovary with 1 or 2 chambers. . . . . ***Hydrophyllaceae***.

11b. Flowers produced in dense head-like clusters. Ovary with 3 chambers. . . . . ***Polemoniaceae*** (*Eriastrum*).

3b. Annual and perennial herbs:

14a. Stamens 8 or 10:

15a. Leaves very succulent and primarily in basal rosettes. Corolla cleft nearly to the base, the segments resembling free petals. Ovaries superior, the fruit is a follicle. . . . . ***Crassulaceae***.

15b. Leaves not succulent and generally opposite and often clustered on the stems. What may at first appear to be a tubular corolla is actually an elongated floral tube with 4 free petals inserted towards the mouth. Ovaries inferior, the fruit is a capsule. . . . . ***Onagraceae*** (*Epilobium canum*).

14b. Stamens 5 or less:

16a. Ovaries inferior or partially inferior (positioned below or partly below the calyx, and completely or partially connected to the calyx):

17a. Stamens united into a tube surrounding the style:

18a. Trailing vines climbing by means of tendrils, and that occur mostly in shady or partly shady (but not wet) habitats. Corollas white or whitish, the lobes sym-metrical. The fruit is a roundish gourd-like structure, the rind covered with non-prickly spines. . . . . ***Cucurbitaceae***.

18b. Often tufted herbs with erect or ascending stems, and that are restricted to perennially wet habitats. Corollas mostly blue and bilabiate (the upper lip 2 lobed and the lower lip 3 lobed). The fruit is a capsule. . . . . ***Campanulaceae*** (*Lobelia*).

17b. Stamens distinct:

19a. Leaves alternate or strictly basal. . . . . ***Campanulaceae***.

19b. Leaves opposite or whorled:

20a. Erect annual herbs. Corollas strongly to slightly bilabiate. Stamens 3. The fruit is an akene. . . . . ***Valerianaceae***.

20b. Annual and perennial herbs, and if annual, then the stems are weak and trailing. Corollas symmetrical or bilabiate, and if bilabiate, then the plants are perennial and with a generally lanky habit of growth. Stamens 4 or 5. The fruit is a berry, drupe or 2 nutlets:
21a. Leaves simple and produced in whorls of 4 to 8. Calyx absent, corollas symmetrical. The fruit is a berry or 2 nutlets. . . . . ***Rubiaceae.***
21b. Leaves simple or compound, and not produced in whorls. Calyx present, corollas symmetrical or bilabiate. The fruit is a berry or drupe. . . . . ***Caprifoliaceae.***
16b. Ovaries superior (positioned above the calyx, and in no way united to the calyx). The ovary may be surrounded by the calyx:
22a. Flowers asymmetrical, some or all of the parts not of equal size and shape. Corollas mostly bilabiate:
23a. Fruit a many-seeded capsule. . . . . ***Scrophulariaceae.***
23b. Fruit comprised of 4 nutlets:
24a. Corollas slightly bilabiate. Ovaries not or only slightly four-lobed. Style terminal and not cleft at the apex. . . . . ***Verbenaceae.***
24b. Corollas strongly bilabiate in most species. Ovaries deeply to slightly 4-lobed. Style generally rising from the base of ovary lobes, and cleft at the apex. . . . . ***Lamiaceae.***
22b. Flowers symmetrical, the parts of equal or nearly equal size and shape:
25a. Pistils (ovaries) 2:
26a. Inflorescence umbellate. Corolla divided nearly to the base, the segments generally reflexed or spreading. Anthers attached to the style. . . . . ***Asclepiadaceae.***
26b. Inflorescence cymose. Corolla united for almost the entire length, and generally urn or bell-shaped. Anthers not attached to the style. ***Apocynaceae.***
25b. Pistil 1:
27a. Ovary deeply lobed and maturing into 1 to 4 nutlets. . . . . ***Boraginaceae.***
27b. Ovary entire or shallowly lobed, and maturing into a capsule or berry:
28a. Fruit a berry. . . . . ***Solanaceae.***
28b. Fruit a capsule:
29a. Stamens opposite the corolla lobes. . . . . ***Primulaceae.***
29b. Stamens alternating with the corolla lobes:
30a. Corollas dry or membranous and pale-translucent. Leaves strictly basal. . . . . ***Plantaginaceae.***
30b. Corollas white or colorful and delicately textured. Leaves not or usually not entirely basal:
31a. Stigmas generally 3 lobed or divided. Ovaries and capsules with 3 chambers. . . . . ***Polemoniaceae.***
31b. Stigmas generally 1 or 2 lobed or divided. Ovaries and capsules with 1 or 2 chambers:
32a. Plants with erect or ascending stems. Flowers produced in coiling cymes. Corollas mostly less than 2 cm. long or wide, but if longer or wider, then blue or partially blue. . . . . ***Hydrophyllaceae.***
32b. Plants ranging from weak and trailing to prostrate or truly vine-like and climbing. Flowers not produced in coiling cymes, or not in readily evident coiling cymes:
33a. Annual herbs with weak but not vine-like stems, or if somewhat vine-like (*Pholostoma*), then the plants climb by means of minute prickles on the angles of the stems (not by tendrils). Leaves mostly pinnately lobed or parted, but never deltate or hastate. Corollas mostly less than 2 cm. long or wide, but if longer or wider, then blue or partially blue. . . . . ***Hydrophyllaceae.***
33b. Perennial herbs with relatively short and prostrate stems, or with long and truly vine like stems that climb by means of tendril. Leaves deltate to hastate, and never pinnately lobed or parted. Corollas 2.5 to 4 cm. long and not blue or bluish. . . . . ***Convolvulaceae.***

ACERACEAE. MAPLE FAMILY.

A family comprised of two genera and about 120 species. The genus *Dipterous* is comprised of only two species, both of which are native to the mountains of southern China.

ACER. MAPLES AND BOXELDERS.

Approximately 118 species of trees and shrubs of northern temperate regions.

Acer macrophyllum Pursh. BIG-LEAF MAPLE (p. 24). *HABIT*: broad-leaf deciduous trees ranging from about 10 to 30 m. (30-95') tall, although plants growing in unfavorable habitats may be shrub-like. *BARK*: generally dark gray and roughly textured. *LEAVES*: opposite and on petioles about 5 to 12 cm. long, the blades generally roundish in outline, about 1 to 4 dm. (4-16") in diameter, and deeply divided into five (or sometimes three) major lobes that are lobed or toothed at the ends of the major veins. As implied by both the common and botanical names, the leaves are the largest of all maples. *INFLORESCENCE*: relatively broad and pendant catkins with more than 30 staminate and perfect flowers. The catkins appear just before the new leaves. *COROLLA*: five yellowish-green petals about 3 mm. long. The petals are about the same size and shape as the sepals. *FRUIT*: two weakly united samaras with wings about 2 to 4 cm. long. The samaras fall with the leaves in autumn. *OCCURRENCE*: common in woodlands at lower to intermediate elevations of the Tassajara region, although on the higher ridges this species tends to have a more restricted distribution, such as on densely forested north-facing slopes or in gulches, where it is often found in association with riparian species. *DISTRIBUTION*: Pacific Slope, from southern Alaska to southern California. *NOTE*: A. D. E. Elmer's Tassajara Hot Springs specimen of June, 1901 (Elmer #3179 DS) served as the type specimen of *Acer hemionitis* E. Greene. Greene proposed a number of segregates based largely on shape of the leaves. ⊕March-April.

ANACARDIACEAE. CASHEW or SUMAC FAMILY.

A primarily tropical family comprised of approximately 70 genera and 850 species. The family includes a number of plants that produce edible fruits or seeds, such as *Mangifera* (mango), *Spondias* (mombin), *Anacardium* (cashew), and *Pistacia* (pistachio). The family also includes a number of ornamental trees, such as *Schinus* (pepper tree) and *Cotinus* (smoke tree).

TOXICODENDRON. POISON OAK, POISON IVY.

Six species of shrubs, vines and small trees of the Americas and eastern Asia. Segregated from *Rhus*.

Toxicodendron diversilobum (Torrey & Gray) Greene [*Rhus diversiloba* T. & G.]. WESTERN POISON OAK (p. 24). *HABIT*: deciduous shrubs or subshrubs ranging from free standing bushes about 1 to 2.5 m. (3-8') tall to lanky subshrubs which climb through the branches of other plants (the most common form in this region), or sometimes vine-like plants which climb high into the branches of trees. *LEAVES*: alternate and on petioles about 1 to 10 cm. long, the blades divided into three ovate to roundish and variously lobed or entire leaflets about 1 to 13 cm. long. The leaves turn red in autumn. *INFLORESCENCE*: flowers are small and borne in drooping axillary panicles. *COROLLA*: five small and greenish-white petals. *FRUIT*: roundish and greenish-white berries about 2 to 6 mm. wide. *OCCURRENCE*: common to abundant at lower to intermediate elevations in the Tassajara region (except for open grassland habitats), but becoming increasingly less common above about 3,000 ft., and generally uncommon to absent above about 4,000 ft. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California. *NOTE*: contrary to its name, Poison Oak is not related to the oaks (*Quercus*), nor is it truly poisonous. The dermatitis which occurs in about 75% of people after contact with the surface oils of this and other *Toxicodendron* species (Poison Ivy, Poison Sumac, etc.) is an allergy that is perhaps unique to our own species (allergies are malfunctions of the immune system, in which the body reacts to an innate substance as if it were toxic). The allergic reaction to Poison Oak is typically acquired, for susceptible individuals usually require one or more previous contacts before the onset of a reaction. The inhalation of smoke produced by burning plants can be fatal. ⊛March-May.

APIACEAE (*Umbelliferae*). CARROT or PARSLEY FAMILY.

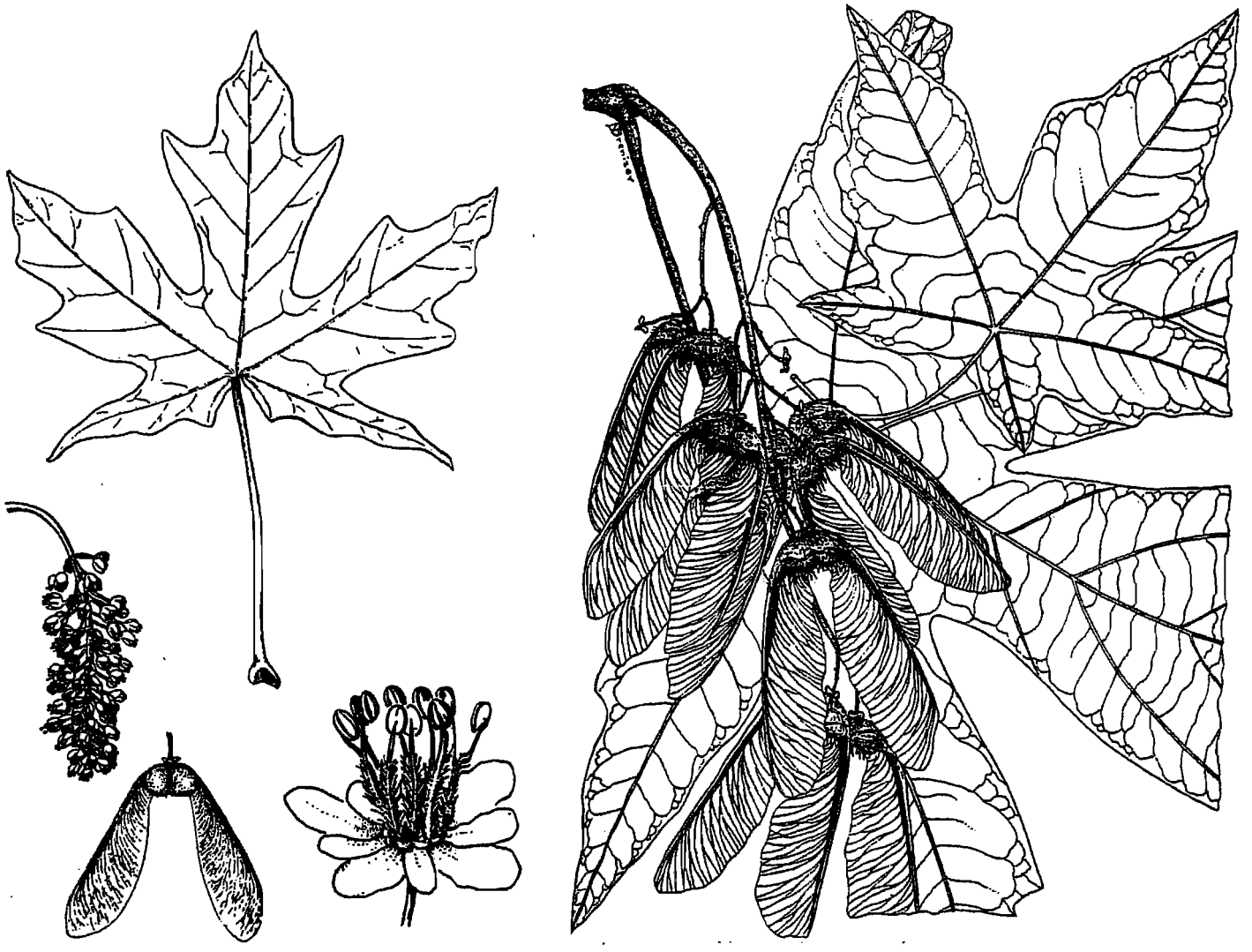
About 300 genera and 3,000 species of annual and perennial herbs primarily of temperate regions. The flowers of plants belonging to this family are typically small to very small and produced in simple or compound umbels. The family is the source of a number of common vegetables, such as carrots, parsnips, fennel and celery, and due to the pleasantly aromatic nature of many species, it is also a major source of culinary herbs and spices, such as dill, anise, angelica, cumin, caraway, parsley, cilantro, coriander, chervil, lovage, etc. Many species, however, are poisonous, such as Poison Hemlock (*Conium maculatum*).

1a. Fruits covered with prickly structures (barbs, scales, bristles, hairs, etc.):
2a. Prickly structures hooked above the base, often near the tip:
3a. Prickly structures consisting of stout barbs or scales. Axis of fruit not marked by an obvious structure. Plants perennial from tuberous roots. . . . . ***Sanicula.***
3b. Prickly structures consisting of slender bristles or hairs. Axis of fruit marked by an obvious structure. Plants annual:
4a. Prickly structures produced in distinct rows along the ribs of the fruit. . . . . ***Yabea.***
4b. Prickly structures without a well defined pattern:
5a. Fruits beaked (i.e., with an elongated appendage at the apex). . . . . ***Anthriscus.***
5b. Fruits beakless. . . . . ***Torilis.***
2b. Prickly structures straight or straight but angled from the base:
6a. Inflorescence consisting of open, spreading umbels. Fruits several times longer than wide and with small & remote prickles. . . . . ***Osmorhiza.***
6b. Inflorescence consisting of contracted head-like umbels. Fruits densely bristly and not more than twice as long as wide. . . . . ***Daucus.***
1b. Fruits glabrous or with non-prickly hairs:
7a. Fruits not flattened and without prominently winged margins:
8a. Plants generally not of wet habitats. Leaves broadly deltoid in outline and two to three times pinnate. Petals yellow. . . . . ***Tauschia.***
8b. Plants of wet habitats. Leaves broadly linear in outline and once-pinnate. Petals white. . . . . ***Berula.***
7b. Fruits more or less flattened and with prominent thin and often paper-like wings on the margins:
9a. Plants much less than 1 m. (3') tall. Leaves finely dissected into numerous leaflets, the ultimate segments narrowly linear. . . . . ***Lomatium.***
9b. Plants quite robust and about 1 to 3 m. (3-10') tall. Leaves divided into three large and very broad leaflets. . . . . ***Heracleum.***

ANTHRISCUS.

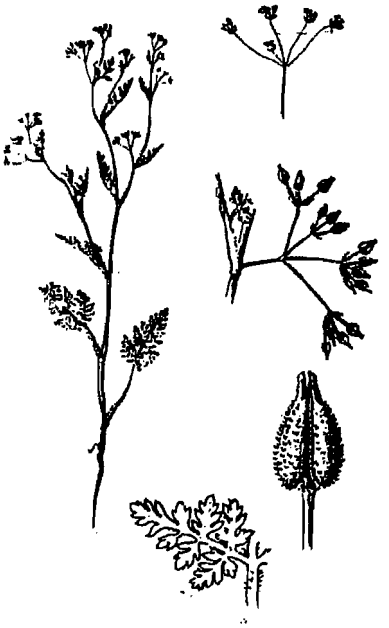
Fifteen species of Eurasia and Africa.

***Anthriscus caucalis** Bieberstein [*A. scandiciana* (Weber) Mansfeld, *A. vulgaris* (Linnaeus) Persoon]. BUR CHERVIL (p. 24). *HABIT*: annual herbs with slender and generally branching stems ranging from about 3 to 9 dm. (1-3') tall. *LEAVES*: alternate and on petioles about 3 to 8 cm. long, the blades about 5 to 15 cm. long and two to three times pinnately divided into small ultimate segments. *INFLORESCENCE*: the flowers are very small and produced in loose compound umbels. *COROLLA*: five minute greenish-white petals. *FRUIT*: ovoid, about 4 mm. long, armed with small hooked prickles, and splitting into 2 carpels in maturity. *OCCURRENCE*: scattered in generally shady but grassy woodland habitats in the vicinity of Tassajara Hot Springs, and perhaps in other areas. *DISTRIBUTION*: a common weed in California; native to Europe. *NOTE*: the bristly carpels of this species cling to the fur, socks, and trousers of passing animals, a very effective (but annoying) means of seed dispersal. ⊛April-June.

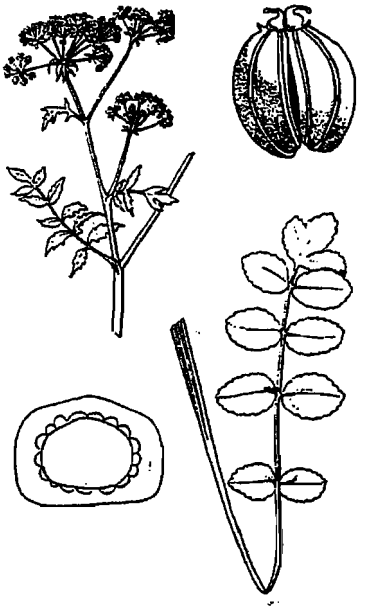


Acer macrophyllum

Toxicodendron diversiloba



Anthriscus caucalis



Berula erecta

BERULA.

One species of the northern hemisphere.

Berula erecta (Hudson) Coville. CUT-LEAF WATER PARSNIP, WATER PARSLEY (p. 24). *HABIT*: perennial herbs of riparian habitats with erect and stoutish stems ranging from about 2 to 8 dm. (8-32") tall. *LEAVES*: alternate and on petioles about 4 to 12 cm. long, the blades up to 15 cm. long and pinnately divided into five to nine pairs of leaflets about 1 to 8 cm. long; the leaflets have irregularly serrate or laciniate margins. The larger lower leaves are long-petiolate with blades which are mostly oblanceolate in outline and divided into fairly broad oblong to lanceolate leaflets, while the upper leaves are short-petiolate with blades that are mostly ovate in outline and divided into narrowly lanceolate to elliptic leaflets. *INFLORESCENCE*: flowers are very small and produced in loose compound umbels. *COROLLA*: five minute white petals. *FRUIT*: oval to orbicular, about 1.5 to 2 mm. long, and splitting into two carpels when mature. *OCCURRENCE*: apparently rare in this region, for I have found only a few plants growing along upper Church Creek, and Griffin ('75) reported this species to be "local in wet spots" on both Pine and Chew's Ridges. *DISTRIBUTION*: widespread in temperate North America, Eurasia and Africa. On the Pacific Slope the species is scattered from British Columbia to northern Baja California. ⊛July-Oct.

DAUCUS. CARROT.

About 20 species of the Americas, Eurasia, North Africa and Australia. The often weedy *Daucus carota* (Queen Anne's Lace) is the ancestor of the domestic carrot.

Daucus pusillus Michaux. RATTLESNAKE WEED, YERBA VIBRA (p. 27). *HABIT*: annual herbs with erect, slender and most commonly simple stems ranging from about 2 to 8 dm. (8-32") tall. *LEAVES*: alternate, the lower long petiolate and the uppermost sessile, the blades ovate to broadly lanceolate in outline, about 3 to 10 cm. long, and two to four times pinnately dissected into small and narrow segments. *INFLORESCENCE*: flowers are very small and compacted in head-like terminal umbels. *COROLLA*: five pale-white petals. *FRUIT*: prickly, two-carpeled, and about 3 to 5 mm. long. *OCCURRENCE*: widely scattered locally common on open grassland slopes and in grassy openings in woodlands and chaparral at lower to intermediate elevations in the Tassajara region. *DISTRIBUTION*: temperate North America, from southern Canada to northern Mexico; also native to temperate South America. *NOTE*: an extract from this herb was used as an antidote to rattlesnake venom. ⊛April-June.

HERACLEUM.

Approximately 80 species of Eurasia and East Africa, with only one occurring in North America.

Heracleum lanatum Michaux. COW PARSNIP (p. 27). *HABIT*: large perennial herbs from thick horizontal rootstocks which annually produce stout stems ranging from about 1 to 3 m. (3-10') tall. *LEAVES*: alternate and on petioles about 1 to 4 dm. long, the blades divided into three large leaflets which are generally roundish to ovate in outline, about 10 to 40 cm. wide, and with margins that are both lobed and coarsely serrate. *INFLORESCENCE*: the flowers are produced in very large compound terminal umbels. *COROLLA*: five white obovate petals. *FRUIT*: about 8 to 12 mm. long, and splitting into two strongly compressed winged carpels. *OCCURRENCE*: common in seepy areas in the vicinity of Divide Camp, and scattered along an unnamed stream about ½ of a mile west of Divide Camp. At one time this species occurred in seepy areas in the headwaters region of Church Creek, near the Church Creek Divide, but this population appears to have died out. *DISTRIBUTION*: widely distributed in the boreal and temperate regions of North America, from Alaska to the Atlantic Coast. In California the species ranges southward through the Coast Ranges to the Santa Lucia Mts. of San Luis Obispo Co., and through the Sierra Nevada to Kern Co., and again in the San Bernardino and San Jacinto Mts. of southern California. ⊛May-July.

LOMATIUM.

About 75 species of North America. The genus is well represented in California, for 35 species plus nine lesser taxa occur within the boundaries of the state, and 19 species plus four lesser taxa are endemic to the California Floristic Province.

1a. Petals tomentose. Fruits orbicular to broadly oblong or oblong-ovate, the wings pinkish to purplish tinged. . . . . ***L. dasycarpum.***
1b. Petals glabrous or nearly so. Fruits elliptic, lanceolate, oblong or oblong-obovate, the wings generally pale-translucent:
2a. Involucel bractlets oblanceolate to obovate and not reflexed. Petals yellow. Fruits oblong to oblong-obovate, the wings about as wide or wider than the main body. . . . . ***L. utriculatum.***
2b. Involucel bractlets linear to ovate and reflexed. Petals white, purplish, or pale yellow. Fruits lanceolate or elliptic to narrowly oblong, the wings generally narrower than the main body. . . . . ***L. macrocarpum.***

Lomatium dasycarpum (Torrey & Gray) Coulter & Rose. LACE PARSNIP (p. 27). *HABIT*: distinctive perennial herbs with one to several erect or ascending stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: alternate and generally confined to the lower-most portions of the stems, the petioles about 2 to 12 cm. long with blades about equal in length, the blades oblong to ovate in outline and up to four times pinnately dissected into innumerable small and congested ultimate segments. *INFLORESCENCE*: relatively broad compound terminal umbels. *COROLLA*: five minute pale-green petals which appear to be white due to a coat of fine woolly hairs. *FRUIT*: orbicular to broadly oblong or obovate with pinkish to purplish-tinged wings, about 10 to 22 mm. long, and splitting into two carpels when mature. The showy fruits are by far the most conspicuous feature of this species. *OCCURRENCE*: widely scattered in open rocky areas in the Tassajara region, but generally uncommon. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Humboldt Co. to northern Baja California. ⊛March-June.

Lomatium macrocarpum (Torrey & Gray) Coulter & Rose. SHEEP PARSNIP (p. 27). *HABIT*: perennial herbs with one to several erect or ascending stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: alternate and generally confined to the lower-most portions of the stems, the petioles about 1 to 7 cm. long, the blades about 2.5 to 15 cm. long, oblong to obovate in outline, at first ternate then two to three times pinnately dissected into narrowly linear to oblong segments. *INFLORESCENCE*: flowers are small and produced in terminal compound umbels. *COROLLA*: five very small petals which are white to pale yellow or purplish. *FRUIT*: about 9 to 20 mm. long, lanceolate to oblong or narrowly elliptic with thin winged margins, and splitting into two

carpels when mature. *Occurrence*: lightly scattered on Chew's Ridge and on Pine Ridge, mostly on serpentine outcrops, but not known to occur elsewhere in this region. *Distribution*: from Manitoba, North Dakota and Utah to British Columbia, and southward through the mountains of the Pacific Slope, to the western Transverse Ranges of Santa Barbara Co. and the Tehachapi Mts. of Kern Co. ⊛ April-June.

Lomatium utriculatum (Nuttall) Coulter & Rose. Hog Fennel (p. 27). *Habit*: aromatic perennial herbs with erect or ascending stems ranging from about 1 to 5 dm. (4-20") tall. *Leaves*: alternate and generally confined to the lower portions of the stems, the petioles about 2 to 10 cm. long, the blades ovate to oblong in outline, 5 to 16 cm. long, and tripinnately divided into narrowly linear segments which vary considerably in length. *Inflorescence*: flowers are very small and produced in dense compound terminal umbels. *Corolla*: five minute yellow petals. *Fruit*: about 5 to 11 mm. long, and dividing into two ovate to oblong and papery-winged carpels in maturity. *Occurrence*: scattered in clay-loam soils in grassland habitats along the Church Creek Fault, which both the Horse Pasture and Church Creek Trails follow, and locally common in colonies, but not known to occur elsewhere in the Tassajara region. *Distribution*: Pacific Slope, from British Columbia to southern California. ⊛March-June.

OSMORHIZA. Sweet Cicely.

About 10 species of the Americas and Asia.

1a. Involucels (subtending the umbels) conspicuous and about 2 to 10 mm. long. The blades of larger leaves divided into at least 20 distinct ultimate segments. . . . . ***O. brachypoda.***

1b. Involucels absent or just small rudiments. The blades of the larger leaves divided into no more than 15 distinct ultimate segments. . . . . ***O. chilensis.***

Osmorhiza brachypoda Torrey. California Cicely (p. 27). *Habit*: aromatic perennial herbs from thick roots, which annually produce branching stems ranging from about 3 to 8 dm. (12-32") tall. *Leaves*: alternate and on petioles about 5 to 20 cm. long, the blades broadly deltoid to ovate in outline, about 10 to 20 cm. long, and two to three times pinnately divided into generally ovate ultimate segments, the margins of which are regularly to irregularly toothed or lobed. The upper-most leaves are nearly or quite sessile and much reduced in size and complexity. *Inflorescence*: flowers are very small and produced in spreading umbels; the pedicels up to 5 cm. long in fruit. *Corolla*: five minute and greenish-white petals. *Fruit*: oblong to spindle-shaped, about 12 to 20 mm. long, and splitting into two carpels when mature. *Occurrence*: widely scattered and locally common in shady woodland habitats of the Tassajara region. *Distribution*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Contra Costa and Sierra Counties to San Diego Co., with a disjunct population in Arizona (in the mountains northwest of Roosevelt Lake). ⊛April-June.

Osmorhiza chilensis Hooker & Arnott [*O. nuda* Torrey]. Wood Cicely, Common Cicely (p. 27). *Habit*: aromatic perennial herbs from thick roots, which annually produce relatively slender and branching stems ranging from about 3 to 12 dm. (12-48") tall. *Leaves*: alternate and on petioles about 5 to 16 cm. long, the blades broadly deltoid to ovate in outline, about 5 to 15 cm. long, and generally one to two times pinnately divided into mostly ovate ultimate segments, the margins of which are irregularly toothed and often deeply three-lobed. *Inflorescence*: the flowers are small and produced in ultimately open and spreading umbels. *Corolla*: five very small and greenish-white petals. *Fruit*: linear-oblong, about 10 to 20 mm. long, and splitting into two carpels when mature. *Occurrence*: widely scattered and locally common in shady or generally shady woodland habitats of the Tassajara region, often in association with *O. brachypoda*. *Distribution*: mostly in western North America, from southern Alaska through the mountains of the Pacific Slope to San Diego Co., and through the Rocky Mountains and "sky islands" of the Great Basin, to Arizona and New Mexico, and extending eastward to southwestern Saskatchewan and the Black Hills of South Dakota. Disjunct populations occur on the Aleutian Islands, the northern Great Lakes region (northern Wisconsin, Michigan and southern Ontario), and in the northeastern United States and southeastern Canada, from New Hampshire and Quebec to Newfoundland Island and Nova Scotia. Also native to temperate South America (Chile and in adjacent areas of Argentina), from the mountains around Santiago to Tierra del Fuego. ⊛April-June.

SANICULA. Sanicle, Snakeroot.

A widely distributed genus of about 40 species.

1a. Basal leaf-blades deeply lobed, but not entirely divided into separate leaflets (at least some leafy tissue is present along both sides of the axis of the primary vein). . . . . ***S. crassicaulis.***

1b. Basal leaves divided into distinct leaflets or segments:

2a. Fruits covered with thick and not prickly scales. . . . . ***S. tuberosa.***

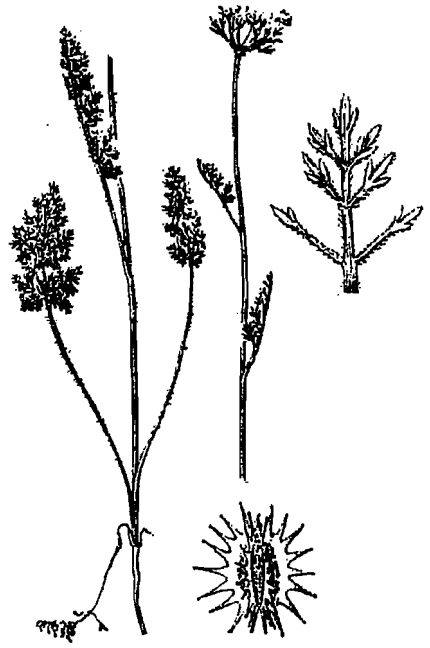
2b. Fruits covered with hooked and prickly barbs:

3a. Blades of major leaves pinnately divided. Staminate flowers four to six per umbel and inconspicuous. . . . . ***S. bipinnata.***

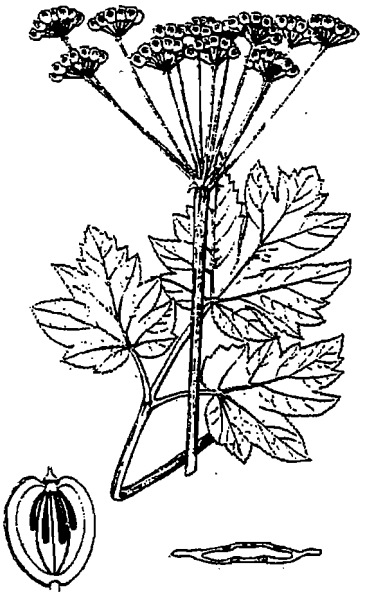
3b. Blades of major leaves ternately divided. Staminate flowers seven to twelve per umbel and conspicuous. . . . . ***S. graveolens.***

Sanicula bipinnata Hooker & Arnott. Pacific Snakeroot, Poison Sanicle (p. 27). *Habit*: aromatic perennial herbs from elongated tuber-like roots which annually produce erect or ascending stems ranging from about 1 to 6 dm. (4-24") tall. *Leaves*: primarily basal (the upper-most much reduced), the petioles about 1 to 14 cm. long, the blades about 3 to 11 cm. long, generally ovate to oblong-ovate in outline, and two to three times pinnately divided into ovate to oblong or elliptic ultimate segments, the margins of which are variously lobed and toothed or sometimes entire. *Inflorescence*: flowers are minute and produced in small and compact head-like umbels. *Corolla*: five very small yellow petals. *Fruit*: roundish to ovate, 2 to 3 mm. long, armed with hooked bristles, and splitting into 2 carpels when mature. *Occurrence*: scattered in open, grassy wood-land habitats at lower to intermediate elevations in the Tassajara region, and fairly common in some areas. *Distribution*: Coast Ranges, Sierra Nevada Foothills and Transverse Ranges, from Mendocino and Butte Counties to Los Angeles Co. ⊛April-May.

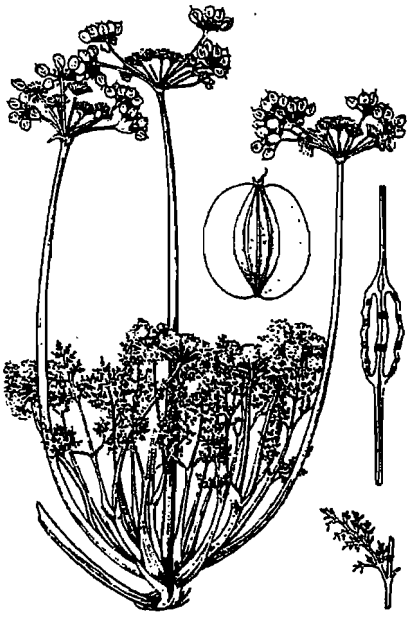
Sanicula crassicaulis Poeppig ex deCandolle [*S. menziesii* Hooker & Arnott]. Gamble-Weed, Pacific Sanicle (p. 27). *Habit*: perennial herbs from strong taproots, with erect and branching flowering stems ranging from about 3 to 10 dm. (12-40") tall. *Leaves*: alternate and on petioles up to 24 cm. long, the blades about 3 to 10 cm. long, roundish to deltoid or cordate in outline, and palmately cleft into three to five major lobes, the margins of which are variously toothed or lobed. Upper leaves are few, much reduced, short-petiolate to sessile, and often cleft into distinct segments. *Inflorescence*: the



Daucus pusillus

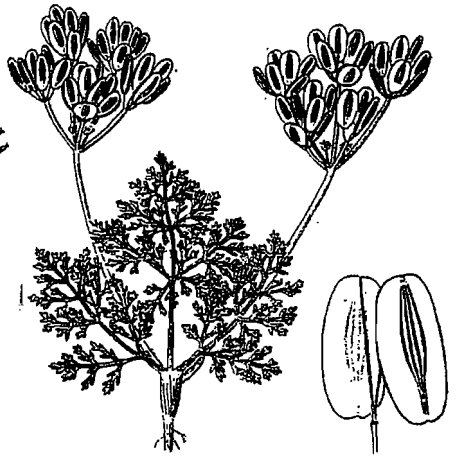


Heracleum lanatum

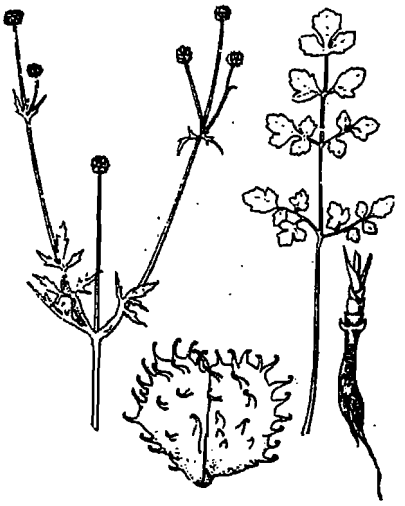


Lomatium dasycarpum

Lomatium macrocarpum

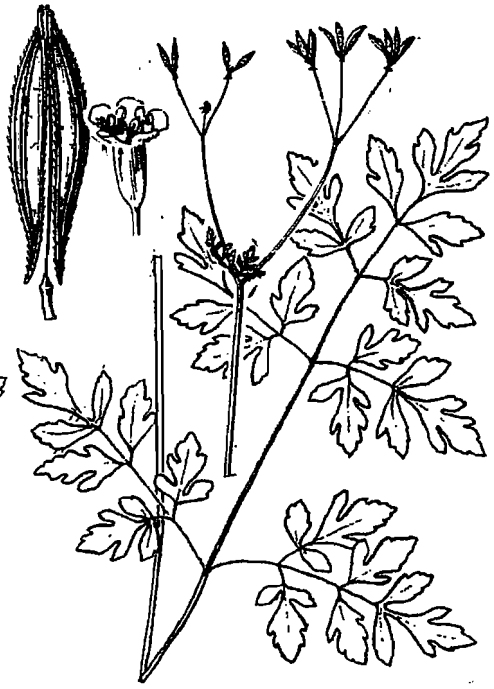


Lomatium utriculatum

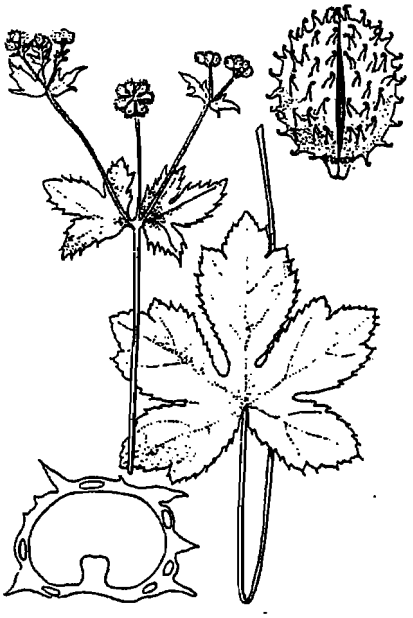


Sanicula bipinnata

Osmorhiza chilensis



Osmorhiza brachypoda



Sanicula crassicaulis

flowers are very small and produced in compact umbels. *COROLLA*: five small yellow petals. *FRUIT*: roundish, about 2 to 5 mm. long, covered with stout hooked bristles, and splitting into two carpels when fully mature. *OCCURRENCE*: one of the most common plants at lower to intermediate elevations in the Tassajara region, and found in nearly all shady or semi-shady habitats, both in woodlands and chaparral. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California. Also native to Chile and adjacent Argentina. ⊛April-May.

⇳**Sanicula graveolens** Poeppig ex deCandolle [*S. nevadensis* Watson, *S. septentrionalis* Greene]. SIERRA SANICLE (p. 31). *HABIT*: perennial herbs from stout taproots which annually produce branching stems ranging from about .5 to 4.5 dm. (2-18") tall. *LEAVES*: alternate and on petioles about as long to much longer than the blades, the blades generally ovate in outline and ternately divided into pinnate or bipinnately divided leaflets. *INFLORESCENCE*: relatively small and compact umbels. *COROLLA*: five very small yellow petals. *FRUIT*: ovate to nearly round, about 3 to 5 mm. long, covered with curved prickles, and splitting into two carpels in maturity. *OCCURRENCE*: scattered on the serpentine outcrop which extends from Pine Ridge to Bear Basin. *DISTRIBUTION*: from British Columbia and western Montana to the mountains of California, where it ranges southward through the north Coast Ranges to Lake Co., and through the Sierra Nevada, to the higher elevations of Transverse and Peninsular Ranges, as far south as the mountains of San Diego Co., with a disjunct population on Pine Ridge in the Santa Lucia Mts. of Monterey Co. The local plants were first discovered by Steven Talley in 1972 (Griffin '75). ⊛April-June.

Sanicula tuberosa Torrey. TURKEY-PEA (p. 31). *HABIT*: perennial herbs from small and roundish tubers which annually produce erect stems ranging from about 1 to 8 dm. (4-32") tall. *LEAVES*: alternate and on petioles about as long to much longer than the blades, the blades about 2 to 13 cm. long, triangular to ovate in outline, and ternately or pinnately divided several times into small entire to pinnately lobed segments. *INFLORESCENCE*: small and head-like umbels. *COROLLA*: five yellow petals about .5 to 1 mm. long. *FRUIT*: roundish, about 1.5 to 2 mm. long, covered with upwardly appressed scale-like formations, and splitting into two carpels in maturity. *OCCURRENCE*: lightly scattered in grassy areas in the Tassajara region, mostly in woodlands but sometimes on open slopes. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southern Oregon to the mountains of northern Baja California. ⊛April-June.

TAUSCHIA.

About 35 species of western North America, Central America, and northern South America. The genus is represented in the Tassajara region by two closely related species; the characteristics of many of the local plants indicate a genetic interchange between the species.

1a. Bractlets subtending umbels generally lanceolate and about 5 to 12 mm. long, and at least several exceeding the flowers and fruits in length. Leaflets about 2.5 to 6 cm. long. Fruits 4 to 7 mm. long and 4 to 5 mm. wide. . . . . ***T. hartwegii.***

1b. Bractlets subtending umbels linear and about 3 to 8 mm. long, and none exceeding the flowers and fruits in length. Leaflets about 1.5 to 3.5 cm. long. Fruits 3 to 5 mm. long and 4 to 6 mm. wide. . . . . ***T. kelloggii.***

Tauschia hartwegii (Gray) Macbride [*Velaea h.* (Gray) Coulter & Rose] (p. 31). *HABIT*: aromatic evergreen perennial herbs with erect or ascending stems ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: basal and on petioles about 5 to 25 cm. long, the blades about 12 to 24 cm. long, generally ovate in outline, and two to three times divided into ovate to oblong ultimate leaflets about 2.5 to 6 cm. long. *INFLORESCENCE*: flowers are very small and produced in terminal compound umbels. *COROLLA*: five minute yellow petals. *FRUIT*: roundish-oblong, about 4 to 7 mm. long, and splitting into two carpels in maturity. *OCCURRENCE*: scattered in woodlands or in the shade of tall stands of chaparral in the Tassajara region, but uncommon. *DISTRIBUTION*: Coast Ranges, Sierra Nevada and western Transverse Ranges, from Contra Costa and Butte Counties to the Santa Monica Mts. of western Los Angeles Co. ⊛April-June.

⇳**Tauschia kelloggii** (Gray) Macbride [*Velaea k.* (Gray) Coulter & Rose] (p. 31). *HABIT*: aromatic evergreen perennial herbs with erect or ascending stems ranging from about 2 to 7 dm. (8-28") tall. *LEAVES*: primarily basal and on petioles about 5 to 15 cm. long, the blades about 8 to 20 cm. long, ovate to roundish in outline, and two to three times divided into oblong to ovate leaflets. The leaflets are about 1.5 to 3.5 cm. long, and the margins are coarsely serrate and often irregularly lobed. *INFLORESCENCE*: compound terminal umbels. *COROLLA*: five very small yellow petals. *FRUIT*: nearly round, about 3 to 5 cm. long, and splitting into two carpels when mature. *OCCURRENCE*: widely scattered in woodlands or in the shade of tall chaparral in the Tassajara region, but generally uncommon. *DISTRIBUTION*: Coast Ranges, from southwestern Oregon to the Santa Lucia Mts. of Monterey Co., and the Sierra Nevada, from Butte Co. to Tulare Co. ⊛April-June.

TORILIS. HEDGE PARSLEY.

About 10 to 15 species of annual herbs that are native to Eurasia.

***Torilis arvensis** (Hudson) Link. COMMON HEDGE PARSLEY (p. 31). *HABIT*: erect annual herbs ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: alternate and on petioles about 1 to 8 cm. long, the blades about 5 to 12 cm. long, ovate to broadly lanceolate in outline, and pinnately divided into narrow leaflets which are pinnately cleft into salient lobes. *INFLORESCENCE*: flowers are small and produced in compound umbels. *COROLLA*: five minute white petals. *FRUIT*: oblong-ovate and about 3 to 5 mm. long, densely covered with spreading bristles, and splitting into two carpels when fully mature. The burr-like carpels readily adhere to fur and fabric, an effective (but highly annoying) means of seed dispersal. *OCCURRENCE*: the first time I saw this species in this region was in April of 1988, when a few plants were seen at Tassajara Hot Springs (the plants were located between the old and new bath houses). If I had known what a threat the plants represented, I would have destroyed them at once. In the following year more plants were present at this site, and a few more were found by the cold-water reservoir a short distance up Tassajara Rd., and at the 4th culvert spring (about 1 mile north of the hot springs). The species has been rapidly spreading ever since, and is now common to abundant on woodland slopes and flats throughout the vicinity of hot springs. In some areas, such as in the shade of oak trees in The Flats, this species appears to have largely to entirely replaced the native shade-loving species that were formerly abundant. *DISTRIBUTION*: a rapidly spreading weed in California; native to Europe. ⊛April-June.

YABEA. WESTERN HEDGE PARSLEY.

One species of western North America.

Yabea microcarpa (Hooker & Arnott) Kozo-Poljansky [*Caucalis m.* H. & A.]. WESTERN HEDGE-PARSLEY (p. 31). *HABIT*: delicate annual herbs with slender and generally erect stems ranging from about 1 to 3.5 dm. (4-14") tall. *LEAVES*: alternate and with petioles about 2 to 3.4 cm. long, the blades about 2 to 6 cm. long, generally ovate in outline, and two to four times pinnately dissected into narrow ultimate segments. *INFLORESCENCE*: flowers are very small and produced in irregular compound umbels. *COROLLA*: five minute white petals. *FRUIT*: about 3 to 7 mm. long, armed with vertical rows of hooked bristles, and splitting into two carpels in maturity. *OCCURRENCE*: widely scattered and locally common at lower to intermediate elevations in the Tassajara region, and occurring mostly in shady but grassy areas within woodland habitats. *DISTRIBUTION*: widely scattered in suitable habitats in western North America, from British Columbia, Idaho and Utah, to Arizona and northern Baja California. ⊛April-June.

Notes on *Apiaceae*.

Although the only Monterey Co. site stated for *Perideridia californica* (California Yampah) by Howitt & Howell ('64) was "Tassajara Springs," I was not able to locate this perennial herb of streamside habitats in the Tassajara region, nor have I found any other references to its existence in or near this region. The label of the voucher specimen, which was collected by Harriet Hatton in the spring of 1917 and is on file at the California Academy of Sciences Herbarium in San Francisco, simply reads "Tassajara Springs, Santa Lucia Mts."

Two *Apiaceae* species which occur in the Santa Lucia Mts. near or relatively near the Tassajara region are *Sanicula bipinnatifida* and *Sanicula laciniata*. Howitt & Howell's ('64) listing of "Chew's Ridge Rd." as a location for *Sanicula laciniata* was based on a specimen collected by Howitt from along Tassajara Rd. about 2 miles south of Jamesburg (re. Howitt #369, CAS).

APOCYNACEAE. DOG BANE FAMILY.

A widely distributed but primarily tropical family comprised of about 200 genera and 2,000 species. Well known members of the family include frangipani (*Plumeria*), oleander (*Nerium*), and the periwinkles (*Vinca* and *Catharanthus*).

APOCYNUM. DOG BANE, INDIAN HEMP.

About seven species of North America. The botanical name, derived from Greek, refers to the former use of some species as a dog poison.

1a. Plants of riparian habitats. Leaves ascending, the blades lanceolate to narrowly ovate, and about 5 to 10 cm. long. Corolla 2.5 to 5 mm. long. . . . . ***A. cannabinum***.

1b. Plants primarily of woodland habitats. Leaves spreading or drooping, the blades roundish to broadly ovate, and about 4 to 6 cm. long. Corolla 4 to 8 mm. long. . . . . ***A. androsaemifolium***.

Apocynum androsaemifolium Linnaeus [*A. pumilum* (Gray) Greene]. BITTER DOG BANE, MOUNTAIN DOG BANE (p. 31). *HABIT*: evergreen perennial herbs with upwardly spreading stems usually less than 3 dm. (1') tall. *LEAVES*: short-petiolate, mostly opposite and slightly drooping, the blades generally oblong-oval or ovate and about 4 to 6 cm. long. *INFLORESCENCE*: terminal and axillary cymes. *COROLLA*: long campanulate with five shallow lobes, about 4 to 8 mm. long, white to pink or red-dish-purple, and sometimes with pink veins. *FRUIT*: a slender and many-seeded follicle about 7 to 11 cm. long. *OCCURRENCE*: scattered in the Ponderosa Pine-dominated forests along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, and according to Griffin ('75), also in open pine forests on Chew's Ridge. *DISTRIBUTION*: widely distributed in temperate North America. In California the species ranges through the Sierra Nevada and higher elevations of the Coast Ranges to the Transverse and Peninsular Ranges, as far south as the Palomar Mts. of San Diego Co. ⊛June-Aug.

Apocynum cannabinum Linnaeus [*A. c.* var. *glaberrimum* deCandolle]. INDIAN HEMP (p. 31). *HABIT*: perennial herbs of wet habitats, with creeping rhizomes which produce erect or ascending stems ranging from about 3 to 6 dm. (1-2') tall. *LEAVES*: mostly opposite, short-petioled to nearly sessile, the blades ascending, lanceolate to lance-ovate in shape, and about 5 to 10 cm. long. *INFLORESCENCE*: flowers are small and produced in terminal and axillary cymes. *COROLLA*: cylindric to urn-shaped with five shallow lobes, about 2.5 to 5 mm. long, and pale green to nearly white. *FRUIT*: slender and many-seeded follicles about 6 to 9 cm. long, which hang pendulously in maturity. *OCCURRENCE*: the only locality in the Tassajara region where I have seen this species was on wet banks along the Arroyo Seco River near the confluence of Tassajara Creek. *DISTRIBUTION*: widely distributed in temperate North America. *NOTE*: the listing of "Tassajara Springs" as a Monterey Co. site for this species by Howitt and Howell ('64) was probably based on A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3180 DS). According to a note enclosed in an envelope pasted to the sheet, Elmer collected the specimen in Lost Valley (about 5½ linear miles south of Tassajara Hot Springs). ⊛June-Aug.

Notes on *Apocynaceae*.

As *Cycladenia humilis* var. *venusta* occurs on Cone and Junipero Serra Peaks (the latter site is the type locality of this taxon), it is possible that it may occur somewhere on the higher ridges of the Tassajara region. The only other populations are located in the San Gabriel Mountains and on the eastern slopes of the Sierra Nevada.

Vinca major (Large-Flowered Periwinkle) is well established as an ornamental around the developed area of Tassajara Hot Springs, and has spread into adjacent areas, such as the old streambed depression between the hot springs and The Flats, and on the hillside adjacent to the old bath house. The plants are evergreen perennial herbs with long and trailing sterile stems and more or less erect flowering stems, generally round-ovate leaves, and large and showy violet to blue corollas about 3 to 5 cm. wide.

ARALIACEAE. GINSENG FAMILY.

About 60 to 70 genera and approximately 700 species of primarily tropical trees, shrubs, woody vines and perennial herbs. The family is particularly well represented on the Malay Peninsula and the Indonesian Archipelago, and in Central America and tropical South America. *Araliaceae* includes the ginsengs (*Panax* species), English Ivy (*Hedera helix*), Octopus Trees (*Schefflera* species), and *Aralia*.

ARALIA.

About 30 species of North America and Asia. The genus includes the spikenards, hercules clubs, and angelica trees.

Aralia californica Watson. CALIFORNIA SPIKENARD, ELK CLOVER (p. 31). *HABIT*: large and aromatic perennial herbs of riparian habitats, with large roots which annually produce robust stems ranging from about 1 to 3 m. (3.4-10') tall. The stems wither away after the first winter frosts. *LEAVES*: alternate and with petioles up to 3 dm. long, the blades at first ternately divided, then pinnately divided into three to (usually) five large ovate to oblong-ovate leaf-lets about 15 to 30 cm. long. The leaflets are generally subcordate at the base and the margins are serrate. *INFLORESCENCE*: the flowers are very small and produced in roundish umbels which are scattered along a generally elongated panicle up to 4.5 dm. in length. *COROLLA*: five greenish-white petals about 2 mm. long. *FRUIT*: roundish and nearly black berries about 3 to 5 mm. in diameter, and containing 3 to 5 seeds . *OCCURRENCE*: locally common and quite conspicuous in deeply shady areas along perennial streams in the Tassajara region. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from southwestern Oregon to Orange Co., and the Sierra Nevada, from Plumas Co. to Mariposa Co. ⊛June-Aug.

ASCLEPIADACEAE. MILKWEED FAMILY.

About 50 to 250 genera and 2,000 to 2,500 species; the family is particularly well represented in the tropical and subtropical regions of South America and southern Africa.

ASCLEPIAS. MILKWEED.

About 100 species of North and South America. Most (if not all) of the species are larval hosts of Monarch Butterflies (*Danaus plexippus*).

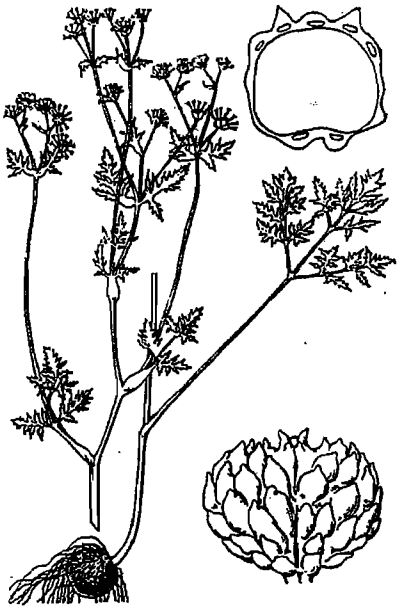
1a. Plants dark-green and glabrous or nearly so. Leaves linear to narrowly lanceolate. . . . . ***A. fascicularis.***
1b. Plants generally gray-green due to a dense coat of white-woolly hairs. Leaves broadly lanceolate to ovate:
2a. Stems erect or mostly so. Flower horns present and generally slightly exserted from the hoods. Widespread and locally common. . . . . ***A. eriocarpa.***
2b. Stems decumbent to ascending. Flower horns absent or minute. Rare in this region. . . . . ***A. californica.***

Asclepias californica Greene [*A. c.* subsp. *greenei* Woodson]. CALIFORNIA MILKWEED, ROUND-HOODED MILKWEED (p. 32). *HABIT*: white-woolly perennial herbs with decumbent or ascending stems ranging from about 1.5 to 5 dm. (6-20") long. *LEAVES*: mostly opposite, sessile or on short petioles, the blades ovate to lance-ovate and about 5 to 15 cm. long. *INFLORESCENCE*: terminal and sometimes axillary umbellate clusters. *COROLLA*: purplish and deeply divided into five lobes about 8 to 10 mm. long (the much more conspicuous hoods are dark maroon). *FRUIT*: ovoid follicles about 5 to 8 cm. long. *OCCURRENCE*: I have seen this taxon only on an serpentine plug along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge. A. D. E. Elmer collected it "on ridge northwest of Pine Valley Camp (Ventana View)" (Elmer #3175 DS), and Griffin ('75) found it somewhere on or near the summit of Pine Ridge. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Contra Costa and Mariposa Counties to northern Baja California. ⊛ April-July.

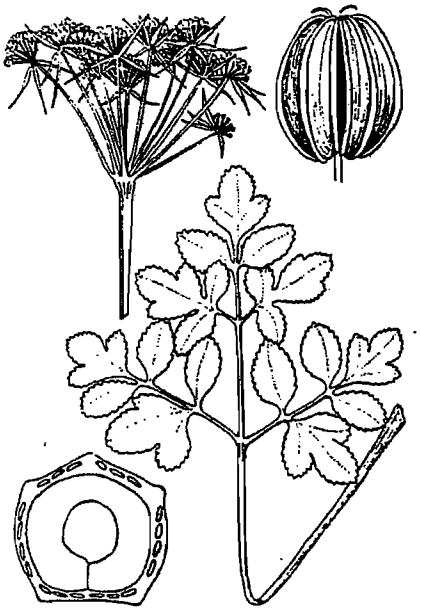
Asclepias eriocarpa Bentham. KOTOLO, INDIAN MILKWEED (p. 32). *HABIT*: often robust perennial herbs from deep-seated roots which annually produce relatively stout stems ranging from about 4 to 12 dm. (16-48") tall. *LEAVES*: opposite or in whorls of 3's or 4's, sessile or on short petioles, the blades rather large (about 6 to 20 cm. long), densely woolly, broadly oblong-ovate to lanceolate (but upwardly folded from the mid-vein), truncate to semi-cordate at the base, and acute to rounded at the apex. *INFLORESCENCE*: the rather exotic flowers are produced in terminal umbellate clusters. *COROLLA*: off-white or creamy and deeply divided into five reflexed lobes about 4 to 5 mm. long. The much more conspicuous floral crowns are surrounded by five petal-like and hood-shaped structures which partially enclose the stamens and pistil. *FRUIT*: a many seeded and narrowly ovoid follicle about 6 to 9 cm. long. The follicles stand more or less erect on deflexed pedicels. *OCCURRENCE*: widely scattered in openings in chaparral and in open and grassy or more or less barren areas in the Tassajara region, and although generally uncommon, the species is locally common to abundant in some areas, such as along Tassajara Road along the crest of Black Butte Ridge, and in areas along the Pine Ridge Trail between the first summit west of Tassajara Rd. and the Church Creek Divide. *DISTRIBUTION*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Mendocino and Shasta Counties to northern Baja California. ⊛June-Aug.

Asclepias fascicularis Decaisne in deCandolle. NARROW-LEAF MILKWEED (p. 32). *HABIT*: perennial herbs with erect or ascending stems ranging from about 2 to 9 dm. (8-36") long. *LEAVES*: short petiolate and produced in whorls of three's to five's, the blades narrowly lanceolate to linear and about 4 to 12 cm. long. *INFLORESCENCE*: terminal and axillary umbellate clusters. *COROLLA*: greenish-white or purplish and deeply divided into five lobes about 4 to 5 mm. long. *FRUIT*: narrow follicles about 6 to 9 cm. long. *OCCURRENCE*: rare on serpentine plugs on Chew's Ridge (re. Griffin '75), but not known to occur elsewhere in this region. *DISTRIBUTION*: from Washington, Idaho and Utah to northern Baja California. ⊛June-Sept.

Sanicula graveolens

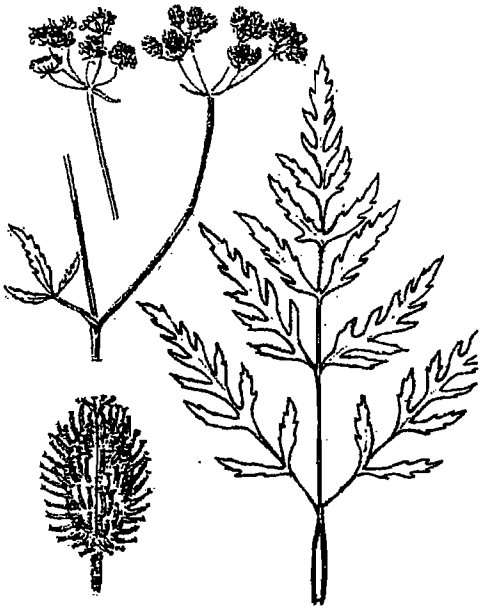


Sanicula tuberosa

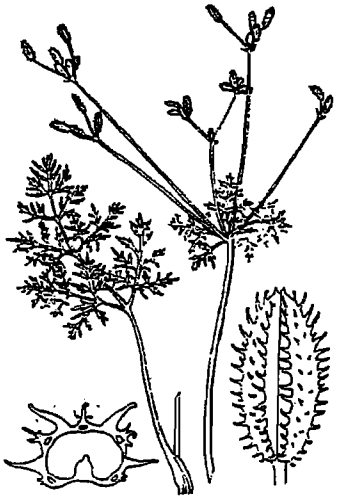


Tauschia hartwegii

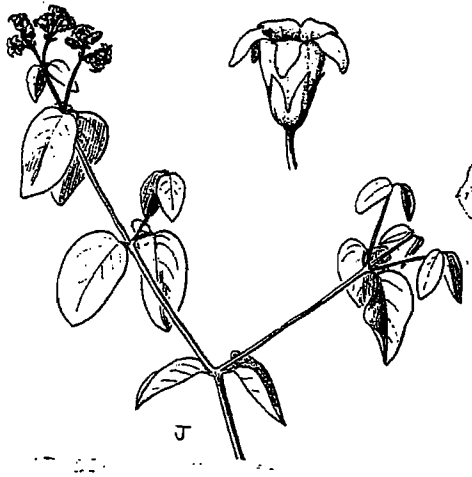
Tauschia kelloggii



Torilis arvensis

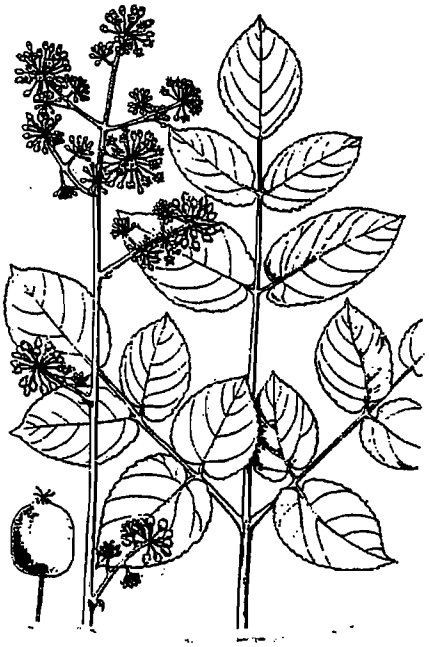


Yabea microcarpa

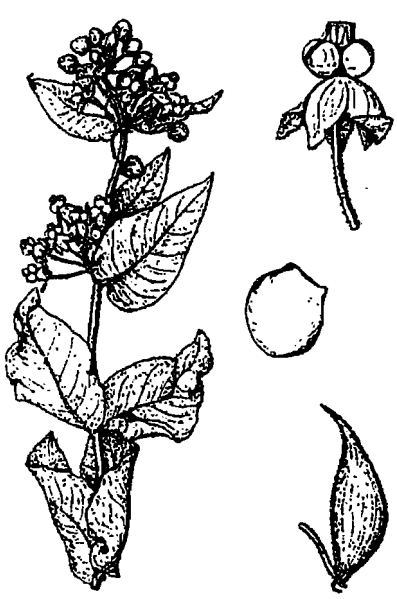


Apocynum androsaemifolium

Apocynum cannabinum



Aralia californica



Asclepias californica

Asclepias eriocarpa

Asclepias fascicularis

ASTERACEAE (Compositae). SUNFLOWER FAMILY.

A massive family comprised of about 1,160 to 1,300 genera and 19,085 to 21,000 species; the species range from small annual herbs to trees. While the family is of worldwide distribution, most of the species occur in temperate regions. Asteraceae is by far the largest family dicotyledons, and is rivaled in size only by the primarily tropical *Orchidaceae* (Orchid Family). As to be expected in northern temperate regions, *Asteraceae* is by far the largest vascular plant family in California, and in the Tassajara region at least 63 species in 44 genera are present (not including marginally established weeds), and thus represents about 13% of the local vascular plant species. Due to the large size and distinctive features of the family, it is highly useful for those who have an interest in plant life to soon become familiar with the characteristics of this family.

Asteraceae is the source of many ornamental plants, which include the many types of daisies, sunflowers and asters (primarily of the sub-families *Astereae*, *Heliantheae* and *Helenieae*), marigolds (*Tagetes*), black-eyed susan (*Rubeckia*), *Zinnia*, *Cosmos*, bachelor-buttons or corn-flowers (*Centaurea*), *Chrysanthemum* and *Calendula*, to name just a few. Food producing plants include the many varieties of the domestic lettuce (*Lactuca*), artichoke and cardoon (*Cynara*), endive (*Cichorium*), burdock root (*Arctium*), the oil-producing seeds of safflower (*Carthamnus*), and the seeds of the giant variety of the common sunflower (*Helianthus annuus* var. *macrocarpus*). Some plants are used as flavorful and/or medicinal teas, such as chicory (*Cichorium*), chamomile (*Chamomilla*), yarrow (*Achillea*), and golden-rod (*Solidago*).

What distinguishes *Asteraceae* from all other families of flowering plants are composite flower heads that resemble a single flower. The heads are comprised of few to many small flowers that are completely sessile and tightly compacted on a common *receptacle*. The receptacle is usually disk-like, but may be conical, roundish or cylindrical in some species. The receptacle is typically surrounded by a calyx-like involucre consisting of one or more series of bracts which are known as *phyllaries*. The phyllaries are usually green and herbaceous, but are sometimes dry and scale-like (as in *Inuleae*, the Everlasting Tribe) or thorn-like (as in *Cynareae*, the Thistle Tribe). Ovaries are inferior, stamens are four or five with the anthers usually united into a tube around the style, and the style is singular but two-branched at the apex. The ovaries are commonly crested with highly modified calyx limbs that are known as *pappus*. The pappus segments vary from hair-like to bristle-like or scale-like, and typically form one or more series of persistent or deciduous whorls at the apex of the fruit. Corollas are of two kinds. *Ligulate* or *ray corollas* are tubular at the base but upwardly elongated and resembling a petal (the *ligule*), while *disk* or *tubular corollas* are narrowly cylindrical to funnel-form, and entire or four or five lobed at the apex. Flower-heads are of three types. Heads in which the flowers have only ligulate corollas are known as *ligulate-heads*, heads in which the flowers have only tubular corollas are known as *discoid heads*, and heads in which the outer flowers have ligulate corollas while the inner flowers have only tubular corollas are known as *radiate heads*. Radiate heads are typically daisy-like, with the ligules radiating outward and thus resembling petals.

1a. Flower heads ligulate. Ligules commonly with 5 lobes or teeth at the apex. Vascular fluid usually white or whitish. *LIGULIFLORAE* (Ligulate-Flowered Sub-Family), *CICHORIEAE* (Chicory or Dandelion Tribe):
2a. Ligules white to lavender or pinkish:
3a. Leaves strictly or primarily basal, upper leaves, if present, much reduced in size:
4a. Perennial herbs of shady woodland habitats and usually more than 4 dm. tall. Larger leaves mostly 8 to 15 cm. long, remotely toothed or entire, and densely hairy throughout. . . . . ***Hieracium.***
4b. Annual herbs generally of open habitats and usually less than 4 dm. tall. Larger leaves usually less than 8 cm. long, pinnately lobed, and usually with tufts of woolly hair at the base and between the lobes. . . . . ***Malacothrix.***
3b. Leaves not primarily basal (in *Stephanomeria* the leaves are often largely absent when the plants are fully mature):
5a. Ligules white. Akenes with a long and slender beak. Leaves relatively broad and persistent. . . . . ***Rafinesquia.***

5b. Ligules pale-lavender to rose or flesh-colored, or sometimes nearly white. Akenes not beaked. Leaves relatively narrow and tending to fall before the peak of the flowering season. . . . . ***Stephanomeria***.

2b. Ligules yellow:

6a. Leaves not primarily basal:

7a. Involucres cylindrical. Akenes with a long and slender beak. . . . . ***Lactuca***.

7b. Involucres bowl or bell-shaped. Akenes not beaked. . . . . ***Sonchus***.

6b. Leaves basal or primarily basal (upper leaves, if present, are much reduced in size):

8a. Akenes (or at least the inner akenes) with a long and slender beak:

9a. All akenes beaked. Pappus bristles simple. . . . . ***Agoseris***.

9b. Outer akenes not beaked. Pappus bristles plumose. . . . . ***Hypochoeris***.

8b. Akenes not beaked:

10a. Pappus comprised of slender scales with an awn protruding from a bifid apex. . . . . ***Uropappus***.

19b. Pappus comprised of capillary bristles:

11a. Evergreen perennial herbs usually more than 4 dm. tall, and generally of shady or partly shady woodland habitats. Leaves densely hairy, remotely toothed, the larger about 8 to 16 cm. long. . . . . ***Hieracium***.

11b. Annual herbs usually less than 4 dm. tall, and generally of open or disturbed areas in chaparral. Leaves glabrous, pinnately lobed, the larger less than 10 cm. long. . . . . ***Malacothrix***.

1b. Flower heads radiate or discoid. Ligules, if present, are entire or two to three lobed or toothed at the apex. Vascular fluid is usually clear or translucent. *TUBULIFLORAE* (Tubular Disk-Flowered Sub-Family):

12a. Plants thistles or thistle-like. Phyllaries terminating with stiff and sharp spines. Flower-heads discoid. *CYNAREAE* (Thistle Tribe):

13a. Leaves with spiny-margins. Flower heads more than 2 cm. wide. Corollas ranging from bluish, purplish, pale-pink or bright red. . . . ***Cirsium***.

13b. Leaves without spiny-margins. Flower heads less than 2 cm. wide. Corollas yellow. . . . . ***Centaurea***.

12b. Plants not thistles or thistle-like. Heads discoid or radiate:

14a. Phyllaries dry, opaque to translucent, and white or whitish and sometimes to yellowish or brownish (*Gnaphalium*), or reduced or absent, with the outer flowers and fruits enclosed or nearly enclosed in densely woolly and often sack-like bracts. Heads discoid. *INULEAE* (Everlasting Tribe):

15a. Phyllaries many, very conspicuous, overlapping and mostly well imbricated. Flowers not enclosed in bracts. . . . . ***Gnaphalium***.

15b. Phyllaries absent or few and inconspicuous, and not overlapping. Outer flowers enclosed or nearly enclosed in woolly and sack-like bracts which fall with the akene:

16a. Disk flowers with 15 to 30 pappus bristles. . . . . ***Filago***.

16b. Disk flowers with none or fewer than 6 pappus bristles:

17a. Leaves generally opposite. Receptacle globose. Pappus none. . . . . ***Psilocarphus***.

17b. Leaves alternate. Receptacle convex to cylindrical. Pappus none or of 1 to 5 bristles:

18a. Receptacle not longer than wide. Akenes greatly swollen on the outward side, the styles borne near the center of the inner side. Disk pappus none or of 1 bristle. . . . . ***Micropus***.

18b. Receptacle cylindric and many times longer than wide. Akenes straight or nearly so, the styles terminal or subterminal. Disk pappus of 1 to 5 bristles. . . . . ***Stylocline***.

14b. Phyllaries generally green or only the margins dry, translucent or scale-like. Outer flowers not enclosed in densely woolly sack-like bracts (but may be enclosed by phyllaries). Heads discoid or radiate:

19a. Style branches more or less club-shaped, narrowing to the base, nearly round in cross section, and stigmatic (pollen receiving) only near the base. Heads discoid. *EUPATORIEAE* (Eupatory Tribe). . . . . ***Brickellia***.

19b. Style branches more or less flattened in cross-section and stigmatic from the middle or beyond. Heads discoid or radiate:

20a. Receptacle with chaff scales subtending at least some of the disk flowers (ours most commonly as a single series between the ray flowers and disk flowers), the scales curved around the ovaries. *HELIANTHEAE* (Sunflower Tribe):

21a. Phyllaries in 2 to 3 series, none enfolding ray-akenes. Receptacle very chaffy. *VERBESININAE* (Crown-Beard Subtribe). . . . . ***Wyethia***

21b. Phyllaries mostly in 1 series, and partially to completely enclosing a ray akene. Chaff scales mostly in a single series between ray and disk flowers. *MADIINAE* (Madia Subtribe):

22a. All akenes without pappus:

23a. Plants glandular, especially on the upper stems. Leaves covered with rather coarse hair. . . . . ***Madia***.

23b. Plants not glandular, except for small yellow glands at the base of the upper leaves and heads. Leaves covered with fine and semi-silky hair. . . . . ***Lagophylla***.

22b. Disk akenes (or at least the inner-most akenes) crested with pappus:

24a. Perennial herbs of shady woodland habitats. . . . . ***Madia***.

24b. Annual herbs of open and usually grassy habitats:

25a. Phyllaries and upper bract-like leaves terminated with prominent tack-shaped glands. . . . . ***Calycadenia***.

25b. Phyllaries and upper leaves not terminated by tack-like glands:

26a. Lower leaves opposite and entire. Pappus comprised of broad pappus scales. Corollas at first yellow but turning crimson-red with age. . . . . ***Achyrachaena***.

26b. Lower leaves alternate and pinnately lobed. Pappus comprised of narrow pappus bristles, with an understory of hair like bristles. Corollas deep yellow to slightly orangish. . . . . ***Layia***.

20b. Receptacle naked, or if with chaff scales, the scales flat and not surrounding an ovary:

27a Style branches truncated at the apex, and rarely with an appendage (although usually crested by a tuft of fine hairs):

28a. Phyllaries mostly in several series and usually well imbricated, the margins sometimes dry and/or membranous or paper-like. Akenes without pappus or with scale-like pappus (ours minute). *ANTHEMIDEAE* (May Weed Tribe):

29a. Heads radiate, the ligules white and conspicuous. Receptacle with chaff scales. Inflorescence slightly convex to nearly flat-topped. ***Achillea***.

29b. Heads discoid. Receptacle naked. Inflorescence an elongated panicle. . . . . ***Artemisia***.

28b. Phyllaries mostly in a single series, but often with a reduced series near the base of the involucre. Akenes crested with slender pappus bristles. *SENECIONEAE* (Senecio Tribe):

30a. Leaves opposite or mostly opposite. . . . . ***Arnica***.

30b. Leaves alternate or rising from the ground separately from the flowering stems:

31a. Perennial herbs of wet and usually shady streambed habitats. Leaves rising from the ground separately from the flowering stems, the blades roundish in outline, up to 4 dm. wide, and palmately cleft into seven to ten lobes (leaves of the flowering stems are bract-like). . . . . ***Petasites***.

31b. Weedy annual herbs of generally open and dry habitats. Leaves irregularly pinnately lobed. . . . . ***Senecio***.

27b. Style branches not truncated at the apex, and usually terminated by a small appendage:

32a. Phyllaries mostly in a single series and not or just slightly overlapping. Disk and ray corollas (if present) usually yellow (ligules reddish-purple in *Hulsea*). Style branches of various types; appendages (if present) hairy on both sides. *HELENIEAE* (Sneeze Weed Tribe):

33a. Receptacle round or roundish, the heads more or less spherical. Ligules small and turned downwards, parallel to the stem. . . . . ***Helenium***.

33b. Receptacle flat or convex, the heads more or less daisy-like in appearance. Ligules spreading (small and inconspicuous in *Rigiopappus*):

34a. Woody-based subshrubs. Leaves three to five times parted into narrowly linear segments. . . . . ***Eriophyllum***.

34b. Herbaceous plants. Leaves simple, the margins entire or toothed:

35a. Perennial or biennial herbs occurring above about 3,000 ft. elevation. Leaves ranging from oblanceolate to oblong or elliptic and with toothed margins. Ligules reddish-purple. . . . . ***Hulsea***.

35b. Annual herbs of wider distribution. Leaves narrowly linear and entire. Ligules yellow:

36a. Leaves opposite. Ligules showy and bright-yellow. Phyllaries not enclosing the akenes. . . . . ***Lasthenia***.

36b. Leaves alternate. Ligules inconspicuous and pale-yellow. Phyllaries nearly enclosing the outer akenes. . . . . ***Rigiopappus***.

32b. Phyllaries usually in several overlapping and well imbricated series. Disk-corollas commonly yellow, but may be of other colors; ray-corollas (if present) yellow, white, pink, purple, blue, or lavender. Style branches with appendages that are bald on at least the inner surface. *ASTEREAE* (Aster Tribe):

37a. Plants dioecious (the heads with either staminate or pistillate flowers, but never both). Flower heads discoid. *BACCHARIDINAE* (Baccharis Subtribe). . . . . ***Baccharis***.

37b. Plants not dioecious (the heads with staminate and pistillate flowers or perfect flowers). Flower heads discoid or radiate:

38a. Ray-corollas (if present) yellow; disk-corollas yellow. *SOLIDAGININAE* (Golden-Rod Subtribe):

39a. Plants herbaceous or just slightly woody at base. Flower heads radiate (the ligules may be very small and inconspicuous):

40a. Heads generally 5 to 15 mm. wide and terminal on the branches of an open panicle. Ligules 3 to 10 mm. long and usually quite evident. Pappus in two series (the outer bristles much shorter than the inner bristles). . . . . ***Heterotheca***.

40b. Heads generally less than 6 mm. wide and clustered in dense panicles. Ligules about 2 to 5 mm. long and inconspicuous. Pappus simple:

41a. All leaves narrowly linear to linear-lanceolate and entire. Heads clustered at or near the ends of the panicle branches. . . . . ***Euthamia***.

41b. Lower leaves spatulate to oblong-ovate with serrate margins, the upper-most much reduced and generally elliptic with entire margins. Panicles mostly spike-like (or sometimes head-like). . . . . ***Solidago***.

39b. Shrubs. Flower heads discoid:

42a. Leaves oblong to obovate with spiny-toothed margins. . . . . ***Hazardia***.

42b. Leaves narrowly linear and entire:

43a. Leaves numerous and mostly 3 to 6 cm. long. Heads 18 to 25 flowered. Widely scattered and locally common at lower to intermediate elevations. . . . . ***Ericameria***.

43b. Leaves relatively few and mostly 1.5 to 3 cm. long. Heads mostly five flowered. Rare and known only from Chew's Ridge. . . . ***Chrysothamnus***.

38b. Ray-corollas (if present) white, lavender, purple, or bluish-purple; disk-corollas yellow, white, or reddish. *ASTERINAE* (Aster Subtribe):

44b. Heads discoid:

45a. Small and slightly-woody evergreen perennial herbs found only on major rock outcrops and cliffs. Leaves crowded, narrowly linear to narrowly oblanceolate, and entire. . . . . ***Erigeron***.

45b. Annual herbs mostly of open and generally grassy habitats. Leaves generally remote and pinnately lobed. . . . . ***Lessingia***.

44a. Heads radiate (ligules very inconspicuous in *Conyza*; sometimes very small or absent in *Erigeron foliosus*):

46a. Ray and disk corollas white. . . . . ***Conyza***.

46b. Ray corollas ranging from purple, bluish-purple, violet or sometimes nearly white, disk corollas yellow (or rarely reddish):

47a. Phyllaries in 1 or 2 series. All leaves narrowly linear (less than 4 mm. wide). . . . . ***Erigeron***.

47b. Phyllaries in 3 or more series. Lower leaves broadly lanceolate or oblanceolate:

48a. Plants rhizomatic and tending to from leafy patches. Lower leaves broadly lanceolate and about half as wide as long. Style branches of disk flowers without a prominent tuft of yellow hairs. . . . . ***Aster***.

48b. Plants taprooted and with erect to decumbent stems. Lower leaves oblanceolate and less than ¼ as wide as long. Style branches of disk flowers with a dense tuft of stiff yellow hairs. . . . . ***Lessingia.***

ACHILLEA. YARROW, MILFOIL.

About 85 species of North America, Eurasia and North Africa.

Achillea millefolium Linnaeus [*A. m.* var. *californica* (Pollard) Jepson, *A. borealis* Bongard subsp. *c.* (Pollard) Keck]. COMMON YARROW (p. 37). *HABIT*: aromatic perennial herbs with one to several erect stems ranging from about 5 to 12 dm. (20-48") tall. *LEAVES*: alternate, narrowly lanceolate in outline, and two or three times pinnately parted into numerous narrow segments, The lower leaves petiolate and about 10 to 15 cm. long, the are upper shorter, sessile, and clasp the stem at the base. *INFLORESCENCE*: convex to flat-topped terminal clusters. *HEADS*: radiate with white ray and disk corollas, the involucre about 4 to 8 mm. long and with phyllaries in three to four series, the ligules roundish to ovate and about 3 to 4 mm. long, the disk corollas narrow and about 2 to 3 mm. long. *AKENES*: about 2 mm. long and without pappus. *OCCURRENCE*: widespread in the Tassajara region, and locally common in open woodlands. *DISTRIBUTION*: widely distributed in the boreal and temperate regions of Eurasia and North America. ⊛March-June.

ACHYRACHAENA. BLOW-WIVES.

One species of the California Floristic Province.

Achyrachaena mollis Schauer (p. 37). *HABIT*: relatively small annual herbs ranging from about 1 to 4 dm. (4-14") tall. *LEAVES*: linear and about 2 to 12 cm. long, the lower opposite and fused at the base, the upper alternate. The margins are entire or remotely serrulate. *INFLORESCENCE*: the flower-heads are produced singularly on peduncles up to 11 cm. long. *HEADS*: radiate, relatively large (up to 3 cm. wide in fruit), with both the ray-corollas and disk-corollas at first yellow but turning red with age. The inconspicuous ray-corollas are about 10 to 12 mm. long (the ligules 5 to 6 mm. long), while the disk-corollas are about 6 to 10 mm. long. *AKENES*: black and about 5 to 8 mm. long, those of the ray-flowers without pappus and each surrounded by a phyllary, while those of the disk-flowers develop a conspicuous crown often oblong pappus-scales, those of the outer series about 3 to 6 mm. long, while those of the inner series are about 6 to 11 mm. long. The pappus scales spread outward in maturity, thus causing the heads to become spherical in outline. *OCCURRENCE*: although common in relatively flat grassy meadows in the vicinity of The Caves, this species was not found elsewhere in this region. *DISTRIBUTION*: a common member of grassland communities of the California Floristic Province, from southwestern Oregon to northern Baja California. ⊛April-May.

AGOSERIS. WESTERN DANDELION.

About nine species of western North America and one of South America.

1a. Annual herbs. Leaves rounded at the apex, the marginal lobes rather shallow. . . . . ***A. heterophylla.***
1b. Perennial herbs from stout taproots. Leaves acute at the apex, the marginal lobes slender and elongate:
2a. Akenes gradually tapering to the beak. Leaf lobes rarely curving backward. . . . . ***A. grandiflora.***
2b. Akenes squared at the tip, and thus abruptly constricting to the beak. Leaf lobes usually curving backward. . . . . ***A. retrorsa.***

Agoseris grandiflora (Nuttall) Greene. LARGE-FLOWERED AGOSERIS, CALIFORNIA DANDELION, WESTERN DANDELION (p. 37). *HABIT*: dandelion-like perennial herbs from strong taproots, the leafless flower-scapes ranging from about 1.5 to 6 dm. (6-24") tall. *LEAVES*: basal, narrowly lanceolate to oblanceolate, mostly about 10 to 25 cm. long, and usually irregularly pinnately lobed. *INFLORESCENCE*: the rather large flower-heads are singular and terminal on the scapes. *HEADS*: ligulate, the involucre about 2 to 4 cm. long, the corollas yellow and about as long as the inner phyllaries. *AKENE*: about 4 to 7 mm. long and terminated by a long and slender beak which is crested with capillary pappus bristles. *OCCURRENCE*: widespread in the Tassajara region, and locally common in grassy habitats, both in semi-shady woodlands and on open slopes and flats. *DISTRIBUTION*: Pacific Slope and Rocky Mountains, from British Columbia to southern California and Utah. ⊛April-July (-Oct.).

Agoseris heterophylla (Nuttall) Greene. MOUNTAIN DANDELION (p. 37). *HABIT*: annual herbs with flowering stems ranging from about .5 to 4 dm. (2-16") tall. *LEAVES*: primarily by not strictly basal, narrowly oblong to spatulate, about 3 to 15 cm. long, and usually with shortly lobed or toothed margins. *INFLORESCENCE*: the flower-heads are singular and terminal on the stems. *HEADS*: ligulate, the involucre about 8 to 25 mm. long, the corollas yellow and about as long to much longer than the phyllaries. *AKENES*: about 2 to 5 mm. long and terminated by a long and slender beak which is crested with capillary pappus bristles. *OCCURRENCE*: widespread and locally common in the Tassajara region, mostly in grasslands and open woodland habitats. *DISTRIBUTION*: western North America, from British Columbia to northern Baja California and New Mexico. ⊛April-July.

Agoseris retrorsa (Bentham) Greene. SPEAR-LEAFED AGOSERIS (p. 37). *HABIT*: taprooted perennial herbs with leafless scapes ranging from about 1.5 to 5 dm. (6-20") tall. *LEAVES*: basal, narrowly lanceolate to oblong-lanceolate in outline, about 8 to 30 cm. long, and usually with distinctive retrorse (backwardly angled) lobes. *INFLORESCENCE*: the flower-heads are singular and terminal on the scapes. *HEADS*: ligulate, the involucre about 2.5 to 4 cm. long, the corollas yellow and generally exceeding the phyllaries. *AKENE*: about 5 to 7 mm. long and abruptly constricting to a long and slender beak which is crested with capillary pappus bristles. *OCCURRENCE*: widespread and locally common in the Tassajara region, mostly in grassy areas of open woodlands. *DISTRIBUTION*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Washington to southern California. ⊛May-Aug.

ARNICA.

About 27 species of boreal and temperate-montane regions of North America and Eurasia.

1a. Heads radiate. Lower leaves mostly broadly ovate and strongly cordate at the base (and thus heart-shaped). . . . . ***A. cordifolia.***
1b. Heads discoid. Lower leaves mostly ovate to ovate-lanceolate and mostly truncate at the base (or sometimes slightly cordate). . . . . ***A. discoidea.***

⇕Arnica cordifolia Hooker. HEART-LEAFED ARNICA (p. 37). *HABIT*: rhizomatic perennial herbs with erect stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: opposite, the lower long petioled and with broadly ovate-cordate (or occasionally reniform) blades up to 11 cm. long, the upper becoming gradually reduced in size, the upper-most sessile. *INFLORESCENCE*: the flower-heads are singular and terminal or (more commonly) in three's (or five's), the lateral heads opposite on peduncles about 1 to 15 cm. long which are commonly produced in the axils of the upper leaves. *HEADS*: radiate, the involucres about 1 to 2+ cm. long, the corollas yellow, the ray corollas slightly to much longer than the phyllaries, while the disk corollas are about as long to a few millimeters longer than the phyllaries. *AKENES*: narrowly linear, about 6 to 10 mm. long, and crested by a dense ring of hair-like pappus bristles. *OCCURRENCE*: known from only one site in this region: on a shady woodland slope along the Pine Ridge Trail a short distance west of the Church Creek Divide, where a small group of plants (probably representing a single plant) were found in May of 1993. *DISTRIBUTION*: mostly in the mountains of western North America, from Yukon and southeastern Alaska to New Mexico and northern Arizona in the Rocky Mts., and to the north Coast Ranges and the Sierra Nevada on the Pacific Slope, with disjunct populations on Mt. Hamilton of the Diablo Range (Santa Clara Co.), the Santa Lucia Mts. (Monterey Co.), and, according to Munz ('59) and Beauchamp ('86), also in the Santa Ana and Cuyamaca Mts. of Orange and San Diego Counties. Also scattered across Canada to the Lake Superior region (Ontario and the upper Michigan Peninsula). *NOTE*: the only other known collection of this taxon in Monterey County is that of Clare Hardham (Hardham 7037, JEPS), who found it growing at 1,100 ft. in the Los Burros Creek area in May of 1961. However, this species must have been collected in the Santa Lucia Mts. at an earlier date, for both Jepson ('25) and Munz ('59) list the Santa Lucia Mts. of Monterey Co. as a locality. The Santa Lucia Mts. are not listed as a locality in any other reference texts, including the two revisions of the genus (Downie & Denford '88 and Maguire '43) and the local floras (Howitt & Howell '64 & '73, Griffin '75 and Matthews '97). ⊛May-July.

Arnica discoidea Bentham [var. *alata* (Rydberg) Cronquist, var. *eradiata* (Gray) Cronquist]. COAST ARNICA, RAYLESS ARNICA (p. 37). *HABIT*: rhizomatic perennial herbs with erect stems ranging mostly from about 3 to 8 dm. (12-32") tall. *LEAVES*: opposite, the lower long petiolate with deltoid to broadly ovate or lanceolate blades up to 12 cm. long, the middle commonly with winged petioles and with narrowly ovate to lanceolate blades, the upper-most much reduced, sessile, and generally ovate. The margins are irregularly toothed. *INFLORESCENCE*: the relatively large flower-heads are terminal and lateral, the lateral in pairs at the upper nodes. *HEADS*: discoid, the involucres about 10 to 17 mm. long, the corollas yellow and about as long or slightly longer than phyllaries, the outer-most sometimes enlarged and at first may be mistaken for ray-corollas. *AKENES*: about 6 to 8 mm. long, both glandular and hairy, and crested with fine pappus bristles. *OCCURRENCE*: uncommon in woodlands and chaparral on Black Butte, and extending northwestward to at least the vicinity of the first summit of the Pine Ridge Trail west of Tassajara Road. According to Yadon ('79b), it is also present on the summit of "Never-Again Ridge," and according to Griffin ('75), it also occurs on Pine Ridge. *DISTRIBUTION*: Cascades, Coast Ranges, Sierra Nevada and western Transverse Ranges, from southern Washington to Ventura Co., and again in the Santa Ana Mts. of Orange Co. ⊛May-July.

ARTEMISIA. MUGWORT, SAGEBRUSH, WORMWOOD.

About 300 species primarily of the northern temperate regions of Eurasia and North America. Probably due to their aromatic properties, many *Artemisia* species are commonly known as sages, especially those which occur in the Great Basin and adjacent areas, but the true sages belong to *Salvia*, a genus of *Lamiaceae* (the Mint Family).

1a. Shrubs or subshrubs. Leaves gray-green, the lower pinnately divided into linear segments. Akenes crested with minute pappus. . . . ***A. californica.***

1b. Herbaceous perennial herbs. Akenes without pappus:

2a. Leaves gray-green, usually white-woolly on the lower surface, and variable in shape, but never narrowly linear. . . . . ***A. douglasiana.***

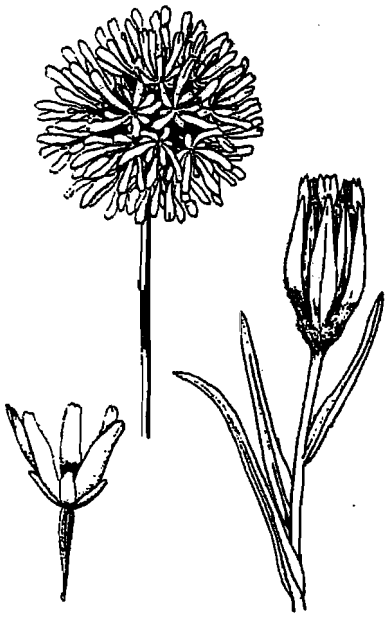
2b. Leaves dark-green, nearly bald on both surfaces, and narrowly linear or cleft into linear segments. . . . . ***A. dracunculus.***

Artemisia californica Lessing. CALIFORNIA SAGEBRUSH, OLDMAN (p. 37). *HABIT*: aromatic and densely leafy gray-green shrubs or subshrubs with fairly lanky branches ranging from about 6 to 15 dm. (2-5') long. *LEAVES*: alternate, the lower up to 8 cm. long and once or twice pinnately divided into linear segments, while the upper are mostly simple and narrowly linear. Smaller leaves are commonly clustered in the axils of the primary leaves. *INFLORESCENCE*: the very small flower-heads are produced in abundance on elongated racemose panicles that terminate the branches. *HEADS*: discoid and about 20 to 40 flowered, the involucres about 2 to 3 mm. long, the corollas pale yellow and less than 2 mm. long. *AKENES*: about .8 to 1.5 mm. long and crested with minute pappus scales. *OCCURRENCE*: scattered at lower to intermediate elevations in the Tassajara region, primarily in transitional areas between chaparral and grasslands, and tending to occur in colonies. *DISTRIBUTION*: outer Coast Ranges, western Transverse Ranges and Peninsular Ranges, from Napa and Marin Counties to northern Baja California. ⊛Aug.-Dec.

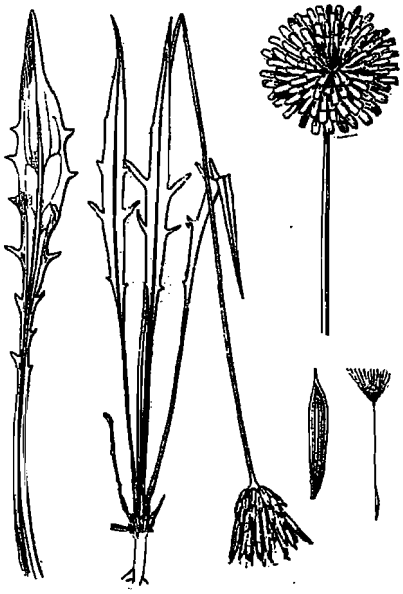
Artemisia douglasiana Besser [*A. vulgaris* Linnaeus var. *heterophylla* Jepson]. CALIFORNIA MUGWORT (p. 37). *HABIT*: rhizomatic evergreen perennial herbs with numerous erect stems ranging from about 5 to 20 dm. (20-78") tall. *LEAVES*: alternate, gray-green and aromatic, about 1 to 12 cm. long, and ranging from broadly oblanceolate in outline and three to five lobed towards the apex, to narrowly lanceolate or elliptic and entire. *INFLORESCENCE*: elongated and leafy terminal panicles comprised of hundreds of minute flower-heads. *HEADS*: discoid and about 15 to 35 flowered, about 2 to 4 mm. wide, the corollas pale yellow and less than 2 mm. long. *AKENES*: less than 1 mm. long and without pappus. *OCCURRENCE*: widespread and locally abundant in the Tassajara region, particularly in semi-shady and/or seasonally moist habitats. *DISTRIBUTION*: from Washington and Idaho to southern California. *NOTE*: the vascular fluid of this species is said to be an antidote to poison oak dermatitis if applied to the skin soon after contact. ⊛June-Oct.

Artemisia dracunculus Linnaeus. TARRAGON, DRAGON SAGEWORT (p. 38). *HABIT*: leafy evergreen perennial herbs with erect or ascending stems ranging from about 5 to 15 dm. (20-60") tall. *LEAVES*: alternate, deep-green, about 3 to 8 cm. long, and narrowly linear and entire or three-cleft into linear segments towards the apex. *INFLORESCENCE*: the small and typically nodding flower-heads are produced in spike-like terminal panicles. *HEADS*: discoid with roundish involucres about 2 to 3 mm. wide, and containing about 20 to 30 minute flowers, the outer of which are pistillate while the inner are staminate. *AKENES*: about .5 to .8 mm. long, generally ellipsoid, and without pappus. *OCCURRENCE*: widely scattered in the Tassajara region, but uncommon, and found mostly in disturbed or transitional areas on open floodplains and southfacing slopes. *DISTRIBUTION*: widely distributed in the northern temperate and arctic regions of Eurasia and North America. *NOTE*: the plants of this region are not as aromatic or spicy tasting as the domesticated culinary herb. ⊛ Aug.-Oct.

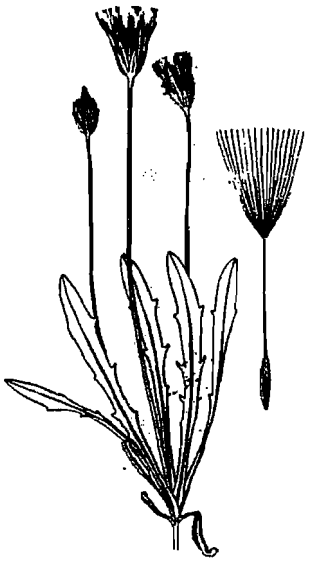
Achillea millefolium



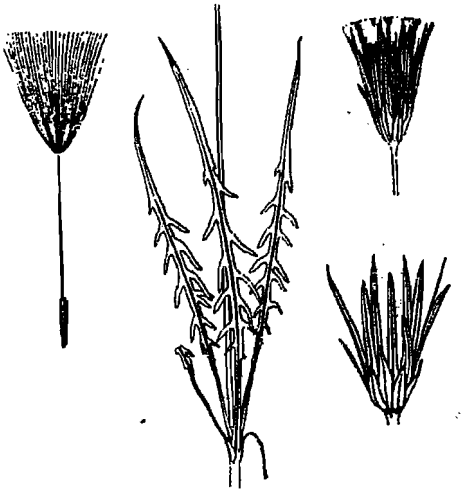
Achyrachaena mollis



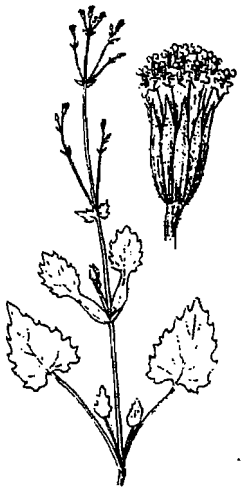
Agoseris grandiflora



Agoseris heterophylla



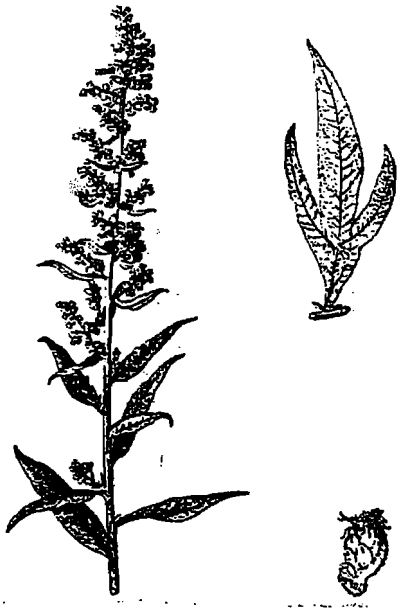
Agoseris retrorsa



Arnica discoidea

Arnica cordifolia

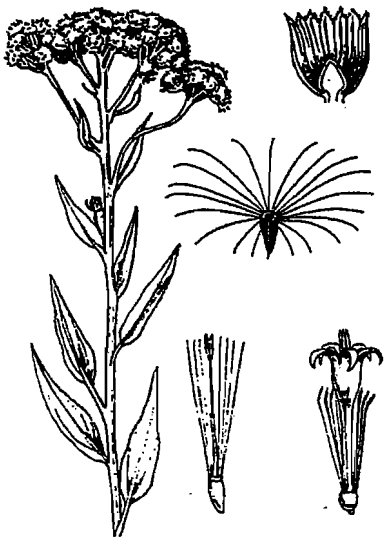
Artemisia californica



Artemisia douglasiana

Artemisia dracunculus

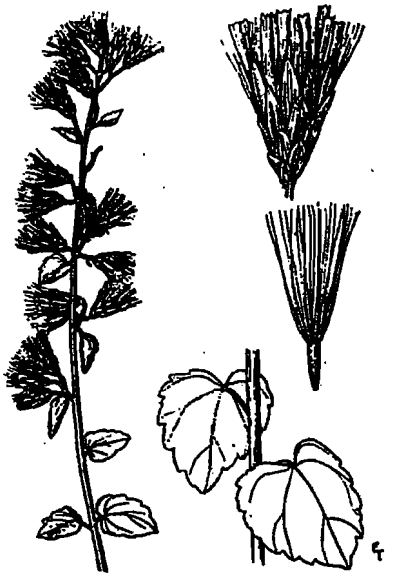
Aster radulinus



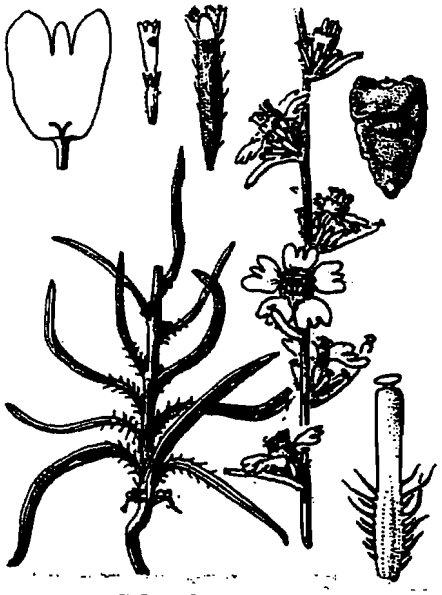
Baccharis douglasii

Baccharis pilularis

Baccharis salicifolia



Brickellia californica



Calycadenia truncata

Centaurea melitensis

Centaurea solstitialis

ASTER.

About 250 species of North America, Eurasia and Africa.

Aster radulinus Gray. BROAD-LEAFED ASTER, ROUGH-LEAFED ASTER (p. 38). *HABIT*: rhizomatic evergreen perennial herbs with flowering stems ranging from about 2 to 7 dm. (8-28") tall. The creeping rhizomes typically produce large and densely-leafy mats which can cover many square feet. *LEAVES*: the basal and lower-cauline leaves are short-petiolate with broadly oval-obovate to oblong-elliptic blades up to 10 cm. long, while the upper leaves become increasingly reduced in size, the upper-most sessile. The margins are sharply serrate. *INFLORESCENCE*: the flower-heads are produced in freely branching terminal panicles. *HEADS*: radiate, the involucre about 6 to 9 mm. long with phyllaries in five to seven series, the ray-corollas about 8 to 12 mm. long and ranging from violet to nearly white, while the disk-corollas are about 7 to 8 mm. long and yellow or sometimes reddish. *AKENES*: about 3 mm. long, more or less compressed, and crested with capillary pappus bristles. *OCCURRENCE*: scattered in clayey-loamed soils in woodlands and in the shade of dense stands of *Ceanothus* chaparral along the Church Creek Fault (which both the Horse Pasture and Church Creek Trails follow), but not seen elsewhere in the Tassajara region. *DISTRIBUTION*: from British Columbia southward, to Mariposa County in the Sierra Nevada, and to the Santa Lucia Mts. of San Luis Obispo Co. in the Coast Ranges, and again on Santa Cruz Island, Santa Barbara Co. ⊛July-Oct.

BACCHARIS.

Anywhere from about 250 to 400 species of the Americas. The genus is particularly well represented in eastern South America.

1a. Shrubs of dry habitats. Leaves oval to obovate, less than 4 cm. long, and mostly with remotely toothed margins. . . . . ***B. pilularis***.
1b. Shrubs or perennial herbs of riparian habitats. Leaves generally narrowly to broadly lanceolate, mostly more than 4 cm. long, and with entire or serrulate margins:
2a. Shrubs, the stems definitely woody and mostly 2 to 4 m. tall in fully mature plants. . . . . ***B. salicifolia***.
2b. Perennial herbs from creeping rhizomes, the stems mostly less than 2 m. tall. . . . . ***B. douglasii***.

Baccharis douglasii deCandolle. MARSH BACCHARIS (p. 38). *HABIT*: rhizomatic perennial herbs of riparian habitats, the stems erect and ranging from about 5 to 20 dm. (20-80") tall. *LEAVES*: petioles less than 1 cm. long, the blades narrowly to broadly lanceolate, entire or serrulate, and about 3 to 10 cm. long. *INFLORESCENCE*: terminal and generally flat-topped corymbose clusters. *HEADS*: discoid, about 3.5 to 6 mm. long, the phyllaries in 2 to 3 series, staminate heads with 26 to 40 flowers and corollas 3.5 to 4.3 mm. long, pistillate heads with 80 to 150 flowers and corollas 1.7 to 3 mm. long. *AKENES*: about .6 to 1.5 mm. long and crested with pappus bristles about 3 to 5 mm. long. *OCCURRENCE*: common along the Arroyo Seco River at the confluence of Tassajara Creek, and sparingly a short distance up Tassajara Creek, but not known to occur elsewhere in this region. *DISTRIBUTION*: Coast Ranges and mountains of southern California, from southern Oregon to San Diego County. Also in the Central Valley and Sierra Nevada Foothills, but less common. ⊛July-Oct.

Baccharis pilularis deCandolle [*B. p.* subsp. *consanguinea* (deCandolle) Kuntze]. COYOTE BRUSH, CHAPARRAL BROOM (p. 38). *HABIT*: densely leafy evergreen shrubs with more or less roundish crowns ranging from about 1 to 3 m. (3-10') tall. *LEAVES*: fairly stiff, oval to obovate, with cuneate bases and obtuse apices, and entire or (usually) with five to nine remote teeth on the margins. *INFLORESCENCE*: flower-heads are produced in terminal and axillary clusters. *HEADS*: discoid, about 3.2 to 5 mm. long, exclusively staminate or pistillate, the corollas very narrow and whitish. Staminate heads have 13 to 34 flowers with corollas 3 to 4.2 mm. long, while pistillate heads have 19 to 43 flowers and corollas mostly 2.5 to 3.5 mm. long. *AKENES*: about 1 to 2 mm. long, ten-nerved, somewhat compressed, and crested by capillary pappus bristles. *OCCURRENCE*: scattered in chaparral and transitional areas at lower and intermediate elevations of the Tassajara region, and although generally uncommon, plants can be fairly numerous in some areas. *DISTRIBUTION*: outer Coast Ranges and coastal slopes of the mountains of southern California, from Oregon to northern Baja California, and the Sierra Nevada Foothills, from Butte Co. to Tuolumne Co. *NOTE*: planted around the developed area of the hot springs is the coastal (typical) form of this species. Such plants differ from the natives (*consanguinea*-like plants) by their low and spreading habit of growth. ⊛Aug.-Dec.

Baccharis salicifolia (Ruiz & Pavon) Persoon [*B. viminea* deCandolle, *B. glutinosa* Persoon]. MULE-FAT, SEEP WILLOW, WATER-WALLY (p. 38). *HABIT*: evergreen shrubs with somewhat lanky branches ranging from about 2 to 4 m. (6-13') tall. *LEAVES*: petioles short and winged, the blades lanceolate to narrowly lanceolate with acute apices, about 2 to 10 cm. long, and with usually entire but sometimes remotely serrate margins. *INFLORESCENCE*: the flower-heads are produced in corymbose panicles terminating the main branches and lateral branchlets. *HEADS*: discoid and about 3 to 6 mm. long, the flowers exclusively staminate or pistillate, the corollas very narrow and whitish. Staminate heads have fewer than 50 flowers with corollas mostly 4 to 6 mm. long, pistillate heads have 50 to 150 flowers with corollas 2.2 to 3.5 mm. long. *AKENES*: about .8 to 1.3 mm. long, slightly compressed, five-nerved, and crested by capillary pappus bristles. *OCCURRENCE*: fairly common along perennial and sometimes seasonal streams at lower to intermediate elevations in the Tassajara region. *DISTRIBUTION*: from Oregon and Colorado to South America. ⊛mostly March-July.

BRICKELLIA.

About 100 species of the warmer regions of the Americas, and especially of the desert regions of the southwestern United States and Mexico.

Brickellia californica (Torrey & Gray) Gray. CALIFORNIA BRICKELLIA, CALIFORNIA BRICKELBUSH (p. 38). *HABIT*: evergreen perennial herbs or subshrubs with generally spreading branches ranging from about 5 to 10 dm. (20-40") long. *LEAVES*: alternate and short-petioled, the blades mostly triangular ovate with irregularly serrate margins, and about 1 to 6 cm. long. *INFLORESCENCE*: leafy spike-like panicles with the flower-heads clustered on short lateral branches. *HEADS*: discoid and about 12 to 14 mm. long, the flowers numbering about eight to eighteen and with greenish-white corollas. *AKENES*: slender, about 2 to 3 mm. long, and crested with numerous capillary pappus bristles. *OCCURRENCE*: widely scattered at lower to intermediate elevations in the Tassajara region, mostly on rocky slopes and in dry gulches. *DISTRIBUTION*: Coast Ranges and Sierra Foothills, from Humboldt and Siskiyou Counties to northern Baja California, and east to Colorado, Texas, and northern Mexico. ⊛Aug.-Oct.

CALYCADENIA.

About nine species of the California Floristic Province.

Calycadenia truncata deCandolle [*C. t.* subsp. *microcephala* Hall]. ROSIN-WEED (p. 38). *HABIT*: xerophytic annual herbs with erect and simple or upwardly branched stems ranging from about 3 to 12 dm. (12-48") tall. *LEAVES*: alternate, sessile, narrowly linear with upwardly inrolled margins, up to 10 cm. long, and sharply acute at the apex. The lower (and longest) leaves are generally shed before the plant reaches maturity. Clustered in the axils of the upper leaves and scattered along the upper stems are short cylindrical structures that bear a prominent and tack-like sticky gland at the apex. *INFLORESCENCE*: the flower-heads are mostly singular, the upper-most terminal and the lateral sessile at the nodes of often freely branched panicles. The heads are subtended by ciliately margined and upwardly expanded bracts which are terminated by tack-like glands *HEADS*: radiate, the ray and disk corollas are yellow, and the involucres are about 4 to 10 mm. long. The ray flowers, which number from about three to six, have broad and outwardly three-lobed ligules about 7 to 12 mm. long, which often have a conspic-uous red dot just outside the basal tube. Disk flowers number about 3 to 25. *AKENES*: about 3 or 4 mm. long. The ray-akenes are generally broader, partly enclosed by the phyllaries, and without pappus, while the disk-akenes are narrower and crested with short and chaffy pappus scales. *OCCURRENCE*: widely scattered and locally common on open and generally grassy slopes in the Tassajara region. *DISTRIBUTION*: Coast Ranges, from Mendocino Co. to Santa Clara Co. and again in the Santa Lucia Mts. of Monterey and San Luis Obispo Counties, and in the Sierra Nevada Foothills, from Plumas to Mariposa Counties. ⊕(July) Aug.-Nov.

CENTAUREA. STAR-THISTLE, KNAPWEED.

About 500 species primarily of Eurasia and Northern Africa, and although two species are native to North America, neither occur in California.

1a. Plants branching mostly above the base. Phyllary spines purplish, the longest usually no more than 10 mm. long. . . . . ***C. melitensis.***
1b. Plants branching from the base. Phyllary spines yellowish, the longest about 10 to 25 mm. long. . . . . ***C. solstitialis.***

***Centaurea melitensis** Linnaeus. PURPLE STAR-THISTLE, TOCALOTE, NAPA THISTLE (p. 38). *HABIT*: erect annual herbs about 2 to 9 dm. (8-36") tall. *LEAVES*: alternate, the basal lyrate-pinnatifid and up to 15 cm. long, the upper narrow, sessile with decurrent bases, mostly entire, and gradually reduced in size. *INFLORESCENCE*: the flower-heads are produced singularly or in small groups, the lateral nearly sessile. *HEADS*: discoid with yellow corollas about 10 to 12 mm. long, the involucre ovoid and about 10 to 15 mm. long, the phyllaries terminating with slender and purplish spines about 5 to 10 mm. long. *AKENES*: about 2.5 mm. long and crested with capillary pappus bristles about 2.5 to 3 mm. long. *OCCURRENCE*: scattered in open and usually grassy areas in the Horse Pasture and the Church Creek area, and occasionally around the developed area of Tassajara Hot Springs. *DISTRIBUTION*: an often problematic weed in California; native to Europe. *NOTE*: this species was apparently first naturalized around Napa and spread throughout the state via seed-grain, hence the name Napa Thistle (Jepson, '25). ⊕May-June.

***Centaurea solstitialis** Linnaeus. YELLOW STAR-THISTLE (p. 38). *HABIT*: erect annual herbs about 3 to 10 dm. (12-40") tall. *LEAVES*: the basal leaves are pinnately lobed and about 5 to 15 cm. long, the upper leaves unlobed, narrow with strongly decurrent bases, and reduced in size. The basal leaves are largely absent by the time the plant begins to bloom. *INFLORESCENCE*: flower-heads are mostly terminal on the branches of an open panicle. *HEADS*: discoid with yellow corollas about 13 to 20 mm. long, the involucre ovoid and about 13 to 17 mm. long, the phyllaries terminating with spines about 10 to 25 mm. long. *AKENES*: about 2 to 3 mm. long, those of the outer flowers dark and without pappus, those of the inner flowers light colored and crested with pappus bristles about 2 to 4 mm. long. *OCCURRENCE*: scattered in grassy or disturbed areas along the Horse Pasture Trail, from near the Flag-Rock ridge summit to the Blackberry Creek area. *DISTRIBUTION*: an often problematic weed in California; native to the Mediterranean region. ⊕May-June.

CHRYSOTHAMNUS. RABBIT-BRUSH.

Sixteen species of temperate western North America, especially of the intermountain region.(i.e., between the Pacific Slope and the Rocky Mountains).

Chrysothamnus nauseosus (Pallas) Britton subsp. **mohavensis** (Greene) Hall & Clements. RUBBER RABBIT-BRUSH (p. 43). *HABIT*: often fastigiately branched and frequently nearly leafless shrubs ranging from about 6 to 20 dm. (24-80") tall. *LEAVES*: alternate, narrowly linear, and about 1.5 to 3 cm. long. *INFLORESCENCE*: the flower-heads are produced in rounded to elongated thyrse-like panicles. *HEADS*: discoid, five flowered, the involucres narrow and about 8 to 12 mm. long, the corollas yellow and about 7 to 10.5 mm. long. *AKENES*: about 3 to 8 mm. long and crested with fine pappus bristles. *OCCURRENCE*: scattered on or near serpentine outcrops on the crest of Chew's Ridge, and, at least at one time, near China Camp, where Roxana Ferris collected a specimen in October of 1940 (Ferris #10311 DS). *DISTRIBUTION*: Coast Ranges, from Alameda Co. southward, and the southern Sierra Nevada, from Tulare Co. southward, to the Transverse Ranges, and eastward through the Mojave Desert to Nevada. ⊕August-October.

CIRSIUM. THISTLE.

About 200 species of annual, biennial and perennial herbs of North America and Eurasia.

1a. Corollas pale pink to light bluish or purplish. . . . . *C. occidentale californicum.*
1b. Corollas bright red. . . . . *C. occidental venustum.*

Cirsium occidentale (Nuttall) Jepson var. **californicum** (Gray) Keil & Turner [*C. c.* Gray]. CALIFORNIA THISTLE, SIERRA THISTLE (p. 43). *HABIT*: biennial herbs with erect or ascending stems ranging from about 5 to 15 dm (20-60") tall. *LEAVES*: alternate and pinnately divided into wavy and sharply spiny lobes, the larger basal leaves up to 3.5 dm. long and narrowly lanceolate to oblanceolate in outline, the upper leaves gradually becoming reduced in size and complexity, the upper-most sessile and more or less lanceolate. *INFLORESCENCE*: flower-heads are large and mostly solitary, the lateral on peduncles up to 4 dm. long. *HEADS*: discoid, the involucre roundish and about 1.5 to 5 cm.

wide, the corollas bluish to reddish lavender or often pale pinkish white, about 18 to 35 mm. long, and extending well above the spine-tipped phyllaries. *AKENES*: about 5 to 6 mm. long and crested with a deciduous ring of fine pappus bristles. *OCCURRENCE*: widely scattered and moderately common in the Tassajara region, mostly in open and commonly rocky areas which are transitional between major habitat types. *DISTRIBUTION*: Coast Ranges, Sierra Nevada (below about 7,500'), Transverse and Peninsular Ranges, from Contra Costa and Placer Counties to northern Baja California. ⊛April-July.

Cirsium occidentale (Nuttall) Jepson var. **venustum** (E. Green) Jepson [C. coulteri Harvey & Gray (misapplied), C. proteanum J. T. Howell]. VENUS THISTLE, RED THISTLE. *HABIT*: biennial herbs much like the preceding, but with bright red disk-corollas. *OCCURRENCE*: scattered along Tassajara Rd. from the Chew's Ridge summit to Jamesburg. *DISTRIBUTION*: northern and southern Coast Ranges, southern Sierra Nevada, and western Transverse-verse Ranges, extending to the western edge of the Mojave Desert. ⊛April-July.

CONYZA.

A widely distributed but primarily tropical genus comprised of about 50 species.

Conyza canadensis (Linnaeus) Cronquist [*Erigeron c.* L.]. HORSEWEED (p. 43). *HABIT*: leafy annual herbs with erect stems ranging from about 3 and 20 dm. (1-6.5') tall. *LEAVES*: alternate, entire or serrate, and about 1 to 10 cm. long. The lower leaves are narrowly lanceolate to oblanceolate and petiolate, while the upper are generally linear and sessile. *INFLORESCENCE*: flower-heads are small and produced in open panicles. *HEADS*: inconspicuously radiate (the ligules no more than 1 mm. long), the disk and ray corollas white and about 2.5 to 3 mm. long, the involucres about 2.5 to 4 mm. long. The pistillate ray flowers number about 20 to 40 and the perfect disk flowers number about 7 to 13. *AKENES*: about 1.5 mm. long, oblong-compressed, and crested by fragile and capillary pappus bristles. *OCCURRENCE*: widely scattered in open and grassy or disturbed areas in the Tassajara region. *DISTRIBUTION*: widely distributed in the western hemisphere, from Canada to Chile and Argentina, and a naturalized weed in parts of the eastern hemisphere. *NOTE*: although this species is an aggressive weed in urban and agricultural areas, the plants of this region behave as balanced members of the native flora. ⊛June-Oct.

ERICAMERIA. GOLDENBUSH.

About 27 species of western North American shrubs, 18 of which occur in California. Often included in *Haplopappus*.

Ericameria arborescens (Gray) Greene [*Haplopappus a.* (Gray) Hall]. GOLDEN FLEECE (p. 43). *HABIT*: aromatic and densely foliated evergreen shrubs ranging from about 1.2 to 3 m. (4-10') tall. *LEAVES*: narrowly linear to filiform, glandular, and up to 6 cm. long. *INFLORESCENCE*: dense and flat-topped to rounded cymes terminating the decidedly erect upper branches. *HEADS*: discoid with about 18 to 25 flowers, the corollas yellow and about 4.5 to 5.5 mm. long, the involucres about 4 to 5 mm. long with phyllaries arranged in three to five series. *AKENES*: less than 2 mm. long, five angled, and crested with fragile pappus bristles. *OCCURRENCE*: widely scattered in chaparral at lower to intermediate elevations in the Tassajara region, and locally common in many areas. *DISTRIBUTION*: outer Coast Ranges and western Transverse Ranges, from near the Oregon state line to Ventura Co. ⊛Aug.-Nov.

ERIGERON. FLEABANE DAISY.

A widely distributed genus of about 375 species of annual and perennial herbs and subshrubs.

1a. Stems usually less than 3 dm. long. Heads discoid and without pistillate flowers. Restricted to cliffs and major rock outcrops. . . . . ***E. petrophilus***.

1b. Stems 2 to 10 dm. long. Heads radiate, the ray flowers pistillate. Plants of various habitats. . . . . ***E. foliosus***.

Erigeron foliosus Nuttall [*E. f.* var. *stenophyllus* (Nuttall) Gray]. LEAFY DAISY (p. 43). *HABIT*: perennial herbs with slender stems ranging from about 2 to 10 dm. (8-40") tall. Plants of shady habitats tend to produce just a few long and lanky stems, while plants of open habitats tend to form dense tufts of numerous erect stems from an often semi-woody base. *LEAVES*: alternate, narrowly linear to narrowly oblong, and about 2 to 6 cm. long. *INFLORESCENCE*: the flower-heads are terminal on the branches of an open corymbose inflorescence. *HEADS*: radiate, the involucre about 4 to 7 mm. long with the phyllaries in three to five series, the ray flowers 20 to 45 and with bluish-purple corollas about 6 to 11 mm. long (they may be underdeveloped or absent in some heads), the numerous disk flowers with narrow yellow corollas about 3 to 5 mm. long. *AKENES*: about 1 to 1.5 mm. long and crested with fine pappus bristles. *OCCURRENCE*: widespread and locally common in chaparral and in open or semi-shady woodland habitats in the Tassajara region, particularly in rocky or sandy-soiled areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Humboldt and Amador Counties to northern Baja California. ⊛May-Oct.

⇩**Erigeron petrophilus** Greene. ROCK DAISY (p. 43). *HABIT*: small evergreen perennial herbs with generally clustered and decumbent-ascending stems from an exposed woody root crown. The densely foliated stems range from about 1 to 3 dm. (4-12") long. *LEAVES*: rather evenly crowded, hirsute-pubescent, linear to narrowly oblanceolate, and up to 4 cm. long. *INFLORESCENCE*: the flower-heads are clustered at the end of the stems. *HEADS*: discoid and about 5 to 15 mm. wide, the corollas yellow or sometimes reddish and about 4.5 to 6.5 mm. long, the involucres about 5 to 9 mm. long with the phyllaries in three to five series. *AKENES*: about 1 to 2 mm. long and crested with slender pappus bristles. *OCCURRENCE*: scattered on cliffs and major rock outcrops in the Tassajara region, such as on the massive sandstone boulders along the Church Creek Fault, at The Narrows, around Tassajara Falls, etc. *DISTRIBUTION*: scattered in suitable habitats in the Coast Ranges, from northwestern California to the Santa Lucia Mountains of northwestern San Luis Obispo Co. ⊛June-Sept.

ERIOPHYLLUM. WOOLLY SUNFLOWER.

About 14 species of western North America. All of the species (plus numerous lesser taxa) occur in California, and eight are endemic to the California Floristic Province.

Eriophyllum confertiflorum (deCandolle) Gray [*E. c.* var. *laxiflorum* Gray]. GOLDEN YARROW (p. 43). *HABIT*: tufted subshrubs with erect or ascending branches ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: about 1 to 5 cm. long, gray-green, cuneate to obovate in out-

line, and mostly three to five parted or bipinnately parted into narrowly linear segments. *INFLORESCENCE*: the flower-heads are produced in convex to flat topped terminal clusters. *HEADS*: radiate with bright yellow ray and disk corollas, the involucres about 3 to 7 mm. long, the ray flowers four to six and with roundish to ovate ligules about 2 to 5 mm. long, the disk flowers 10 to 35 with tubular corollas 2 to 3 mm. long. *AKENES*: four-angled, about 2 to 3 mm. long, and crested with pappus bristles of about the same length. *OCCURRENCE*: widespread and locally common in the Tassajara region, primarily on open and rocky slopes in chaparral *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Mendocino and Calaveras Counties to northern Baja California. *NOTE*: most of the plants of this region have heads which are nearly sessile and thus tightly compacted, the most typical growth form of the species. Many plants, however, have heads borne in loose clusters on pedicels 1 to 3 cm. long. Such plants correspond to var. *laxiflorum* Gray. ⊕May-Aug.

EUTHAMIA. GRASS-LEAFED GOLDENROD.

About eight species of North America. Often included in *Solidago*.

Euthamia occidentalis Nuttall [*Solidago occidentalis* (Nuttall) Torrey & Gray]. WESTERN GOLDENROD (p. 43). *HABIT*: rhizomatic perennial herbs with erect and usually branched stems ranging from about 6 to 20 dm. tall. *LEAVES*: alternate, sessile, linear to lance-linear, and about 4 to 10 cm. long. *INFLORESCENCE*: panicle-like, with the flower-heads more or less clustered towards the ends of the terminal and ascending lateral branches. *HEADS*: radiate with yellow ray and disk corollas, the involucres about 3 to 5 mm. long, the ray flowers 15 to 25 and with narrow ligules about 1.5 to 2.5 mm. long, the disk flowers 6 to 15 and with corollas about 3 to 4 mm. long. *AKENES*: about 1 mm. long and crested with a ring of fine pappus bristles. *OCCURRENCE*: rare in this region, and known from only one site: a wet ditch along Tassajara Road a short distance north of China Camp. *DISTRIBUTION*: widely distributed in western North America, from British Columbia and Alberta to northern Baja California and Texas. ⊕July-November.

FILAGO. COTTON ROSE, HERBA IMPIA.

About 25 species of western and southwestern Eurasia, North Africa, and southwestern temperate North America.

1a. Leaves subtending flower-heads about as long to about 1.5 times as long as the heads, and generally oblong to linear or narrowly lanceolate. Lateral heads or clusters produced in the axils of the leaves. Outer chaff scales evenly curved above akenes, the longest less than 3.3 mm. . . . . ***F. californica.***

1b. Leaves subtending flower-heads mostly about 2 twice as long as the heads or longer, and generally narrowly lanceolate with a sharply acute and awl-like apex. Lateral heads or clusters mostly restricted to the axils of the branches. Outer chaff scales bent abruptly inward above akenes, the longest 3.3 mm. or more in length. . . . . ***F. gallica.***

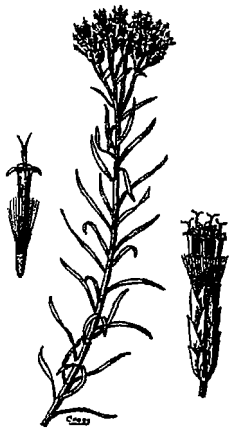
Filago californica Nuttall. CALIFORNIA COTTON-ROSE (p. 43). *HABIT*: woolly annual herbs with slender erect stems ranging from about .5 to 4 dm. (2-16") tall. *LEAVES*: alternate, sessile, linear to narrowly oblanceolate, and less than 2 cm. long. *INFLORESCENCE*: the flower-heads are terminal and axillary and mostly clustered. *HEADS*: discoid and about 3 to 4.5 mm. long, the outer-most pistillate flowers (and akenes) enclosed by white-woolly chaff scales, the corollas of the four to seven disk flowers tubular-filiform, generally reddish-purple, and about 1.9 to 2.8 mm. long. *AKENES*: akenes of the outer flowers are about 1 mm. long and without pappus, while those of the inner perfect flowers are smaller and crested with capillary pappus bristles. *OCCURRENCE*: widespread and locally common in open habitats in this region, particularly in poor-soiled and sparsely vegetated areas. *DISTRIBUTION*: Coast Ranges, Central Valley and Sierra Nevada Foothills, from about Mendocino and Butte Counties southward to northern Baja California, and east to Utah and western Texas. ⊕March-June.

***Filago gallica** Linnaeus [*Logfia g.* (L.) Cossen & Germ.]. FRENCH COTTON-ROSE (p. 45). *HABIT*: woolly annual herbs with slender and erect stems ranging from about 2 to 3 dm. (8-12") tall. *LEAVES*: alternate, narrowly linear and sharply acute, and less than 3 cm. long. *INFLORESCENCE*: generally dichotomous with the flower heads produced in small clusters which are terminal and in the axils of the branches. *HEADS*: discoid and about 3.5 to 4.5 mm. long, the outermost flowers (and akenes) surrounded by woolly chaff scales, the corollas of the three to five disk flowers brownish to yellowish and about 2 to 3 mm. long. *AKENES*: the outer akenes are about 1 mm. long and without pappus, the inner akenes smaller and crested with fine pappus bristles. *OCCURRENCE*: widely scattered in open habitats at lower and intermediate elevations in this region, and locally common in barren or sparsely grassy areas. *DISTRIBUTION*: a common weed in California; native to Europe. ⊕April-June.

GNAPHALIUM. EVERLASTING.

A widely distributed genus comprised of about 120 species of annual and perennial herbs.

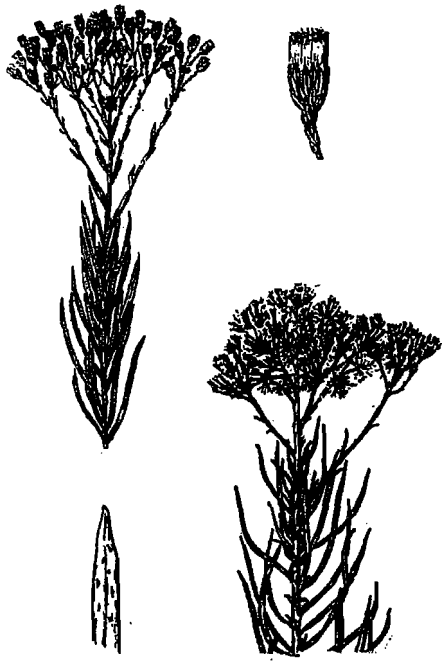
1a. Upper surface of leaves sparsely pubescent to subglabrous and thus light to deep green:
2a. Leaves green on both surfaces. . . . . ***G. californicum.***
2a. Leaves deep green above and densely white-woolly below. . . . . ***G. bicolor.***
1b. Leaves densely to loosely whitish to grayish woolly throughout:
3a. Plants densely white-woolly and more or less aromatic. Basal leaves more or less strongly tufted. Perennial or sometimes biennial herbs:
4a. Lower leaves spatulate to oblanceolate and not strongly decurrent at the base. . . . . ***G. canescens microcephalum.***
4b. Lower leaves narrowly oblong-oblanceolate and very strongly decurrent at the base. . . . . ***G. canescens beneolens.***
3b. Plants densely to loosely gray or whitish-woolly and not or only slightly aromatic. Basal leaves often crowded but not strongly tufted. Annual or sometimes biennial herbs:
5a. Leaves strongly decurrent. Pappus bristles falling singularly. Flower heads 3.8 to 5.2 mm. long. . . . . ***G. stramineum.***
5b. Leaves not or only slightly decurrent. Pappus bristles falling in clusters. Flower heads 3 to 4.2 mm. long. . . . . ***G. luteo-album.***



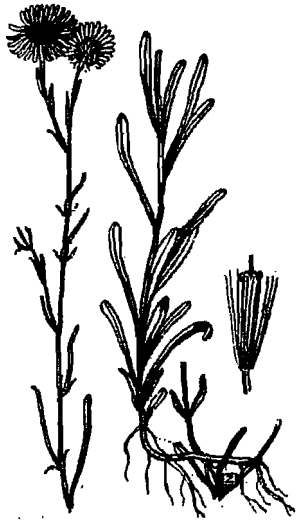
Chrysothamnus nauseosus

Cirsium occidentale

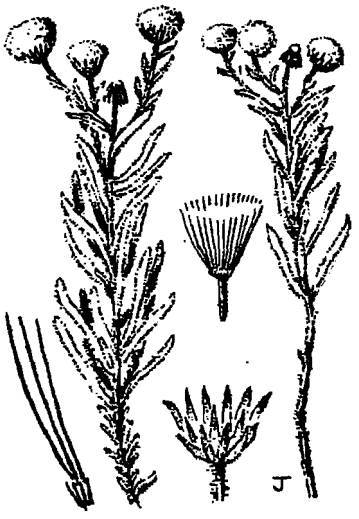
Conyza canadensis



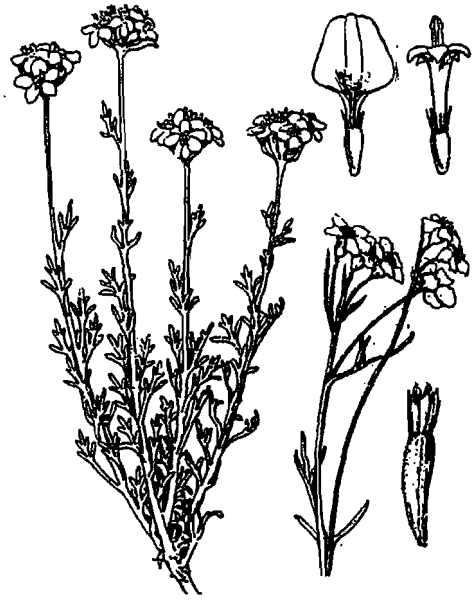
Ericameria arborescens



Erigeron foliosus

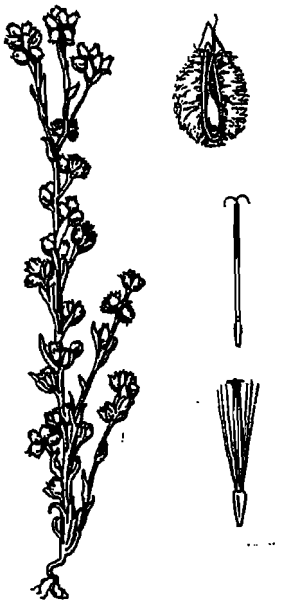


Erigeron petrophilus



Eriophyllum confertiflorum

Euthamia occidentalis



Filago californica

Gnaphalium bicolor Bioletti. GREEN AND WHITE EVERLASTING (p. 45). *HABIT*: aromatic perennial herbs with erect and densely white-woolly stems ranging from about 4 to 9 dm. (16-36") tall. *LEAVES*: alternate, sessile and clasping the stem at the base, oblanceolate to lance-oblong and about 2 to 7 cm. long. The upper surfaces are dark green, the lower surfaces are covered with a dense felt-like coat of white-woolly hair. *INFLORESCENCE*: the heads are produced in generally dense clusters which are mostly corymbosely arranged at or towards the summit of the stems. *HEADS*: discoid and about 5 to 6 mm. long, ovoid to campanulate, the dry phyllaries well imbricated and off-white with semi-glossy sheen. The flowers number about 25 to 50 per head, the corollas of the pistillate flowers are about 3 to 3.5 mm. long. *AKENES*: less than 1 mm. long and crested with a ring of capillary pappus bristles. *OCCURRENCE*: locally common in open and often rocky habitats at lower to intermediate elevations in the Tassajara region. *DISTRIBUTION*: outer Coast Ranges and the mountains of southern California, from Santa Cruz Co. to northern Baja California and the Channel Islands, and the Sierra Foothills, from Madera Co. to Tulare Co. ⊛April-June.

Gnaphalium californicum deCandolle [*G. decurrens* Ives var. *c.* Gray]. CALIFORNIA EVERLASTING (p. 45). *HABIT*: erect aromatic biennial herbs ranging from about 4 to 8 dm. (16-32") tall. *LEAVES*: alternate, sessile with decurrent bases, oblong-oblanceolate to oblong lanceolate or linear, mostly about 2 to 10 (-15) cm. long, the lower larger and often densely crowded. *INFLORESCENCE*: the showy flower-heads are clustered at the summit of the main stem and often on lateral branchlets. *HEADS*: roundish and about 5 to 6 mm. long, the dry phyllaries white, semi-glossy and well imbricated, the flowers numbering from about 50 to 75, the corollas of the pistillate flowers about 3 to 4 mm. long. *AKENES*: less than 1 mm. long and crested with a ring of fine pappus bristles. *OCCURRENCE*: widespread and locally common in open and often rocky habitats in the Tassajara region, but mostly at lower to intermediate elevations. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Oregon northern Baja California. ⊛(Jan.-) April-July.

Gnaphalium canescens deCandolle **subsp. beneolens** (Davidson) Stebbins [*G. b.* Davidson]. FRAGRANT EVERLASTING (p. 45). *HABIT*: white-woolly and aromatic perennial or biennial herbs ranging from about 5 to 11 dm. (20-44") tall. *LEAVES*: alternate, sessile and strongly decurrent, mostly oblong-linear to narrowly oblanceolate or lanceolate, the lower as much as 8 cm. long and the upper-most as little as 1 cm. long. *INFLORESCENCE*: the heads are clustered at the ends of the branches of an open panicle. *HEADS*: about 5 to 6 mm. long, ovoid to campanulate, the dry and semi-glossy phyllaries off-white and imbricated, the flowers numbering from about 30 to 45, the corollas of the pistillate flowers 2.5 to 4 mm. long. *AKENES*: less than 1 mm. long and crested with a ring of fine pappus bristles. *OCCURRENCE*: widely scattered and moderately common in open and usually grassy areas on the higher ridges of the Tassajara region, but apparently rare below about 900 m. (2,950'). *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from northwestern California to San Diego Co. Also on the northern Channel Islands. ⊛July-Nov.

Gnaphalium canescens subsp. **microcephalum** (Nuttall) Stebbins [*G. m.* Nuttall]. WHITE EVERLASTING (p. 45). *HABIT*: densely white-woolly biennial herbs ranging from about 5 to 10 dm. (20-40") tall. *LEAVES*: alternate, sessile and about 1 to 8 cm. long, the lower leaves larger and spatulate to oblanceolate with decurrent bases, the upper generally oblong-linear to narrowly oblanceolate. *INFLORESCENCE*: the heads are produced in relatively small clusters which are corymbosely arranged at the ends of the stems and often terminal on short lateral branchlets. *HEADS*: about 5 to 6 mm. long, the dry phyllaries white and semi-glossy, the flowers numbering from about 35 to 50, the corollas of the pistillate flowers about 3 to 3.5 mm. long. *AKENES*: less than 1 mm. long and crested with a ring of fine pappus bristles. *OCCURRENCE*: widespread and locally common in open or mostly open habitats at lower elevations of the Tassajara region, but apparently absent (or at least rare) above about 900 m. (2,950') elevation. *DISTRIBUTION*: outer Coast, Transverse and Peninsular Ranges, from Marin Co. to northern Baja California. ⊛June-Oct.

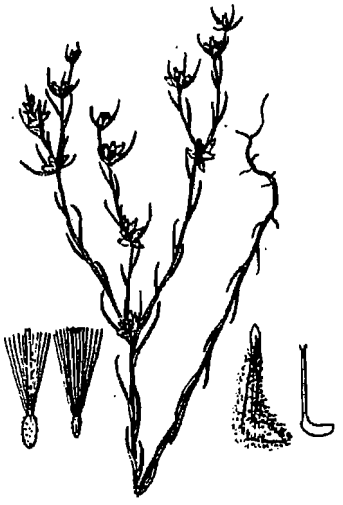
***Gnaphalium luteo-album** Linnaeus. WEEDY CUDWEED (p. 45). *HABIT*: woolly annual herbs with erect or decumbent stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: alternate, linear-oblanceolate to linear-lanceolate, and about 1 to 6 cm. long. *INFLORESCENCE*: the flower-heads are produced in dense terminal clusters. *HEADS*: about 3 to 4.5 mm. long, the phyllaries upwardly yellowish to whitish or brownish, the flowers numbering from about 40 to 100, the corollas of the pistillate flowers about 1.5 to 2 mm. long. *AKENES*: less than 1 mm. long and crested with a ring of fine pappus bristles. *OCCURRENCE*: scattered in open or mostly open habitats in the Tassajara region, but mostly in areas that have had more exposure to human activities. *DISTRIBUTION*: a common weed in California; native to Eurasia. ⊛April-Oct.

Gnaphalium stramineum Kunth [*G. chilense* Sprengel]. COTTON-BATTING PLANT (p. 45). *HABIT*: woolly annual or biennial herbs with erect or ascending stems ranging from about 1 to 7 dm. (4-28") tall. *LEAVES*: alternate, narrowly lanceolate to oblanceolate, decurrent at the base, and about 1 to 7 cm. long. *INFLORESCENCE*: the heads are produced in dense terminal clusters. *HEADS*: discoid, the involucres ovoid and about 4 to 5.5 mm. long, the phyllaries transparent to opaque but upwardly white to straw-colored, the flowers numbering from about 65 to 110, the corollas of the pistillate flowers about 1.8 to 2.5 mm. long. *AKENES*: less than 1 mm. long and crested by a ring of fine pappus bristles. *OCCURRENCE*: widely scattered at lower to intermediate elevations in the Tassajara region, mostly in open areas and sometimes in moist or seasonally moist habitats. *DISTRIBUTION*: western North America, from British Columbia and Montana to northern Baja California and Texas. ⊛June-Oct.

HAZARDIA

Thirteen species of western North America.

⇧Hazardia squarrosa Greene [*Haplopappus squarrosus* Hooker & Arnott]. SAW-TOOTHED GOLDEN BUSH (p. 45). *HABIT*: relatively short evergreen shrubs with generally rounded crowns ranging from about 3 to 12 dm. (12-48") tall. *LEAVES*: oblong to cuneate-obovate with spiny-toothed margins, sessile and often with clasping bases, and about 1 to 4 cm. long. *INFLORESCENCE*: spicate to racemosely paniculate. *HEADS*: discoid, the involucres about 11 to 15 mm. long with glandular and typically recurving phyllaries, the flowers numbering about 18 to 30, the corollas are yellow and about 9 to 11 mm. long. *AKENES*: about 5 to 8 mm. long and crested with slender tawny-yellow pappus bristles. *OCCURRENCE*: widely scattered and locally common at lower to intermediate elevations in the Tassajara region, mostly in openings in chaparral or in transitional areas between chaparral and grasslands. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from the Santa Lucia and Gavilan Mts. (Monterey and San Benito Counties) to the Santa Ynez Mts. (Santa Barbara Co.) ⊛Aug.-Oct.



Filago gallica

Gnaphalium bicolor

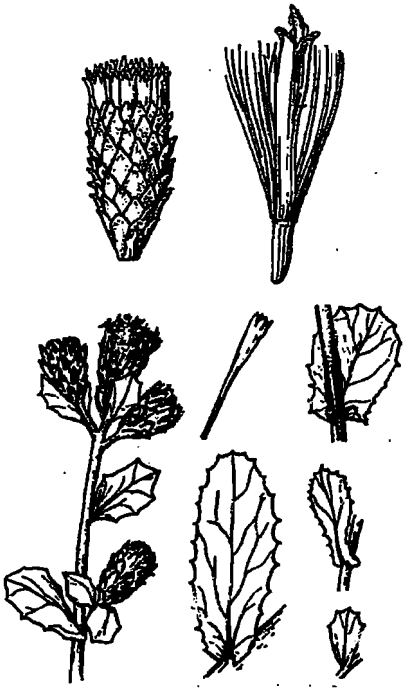
Gnaphalium californicum

Gnaphalium canescens beneolens

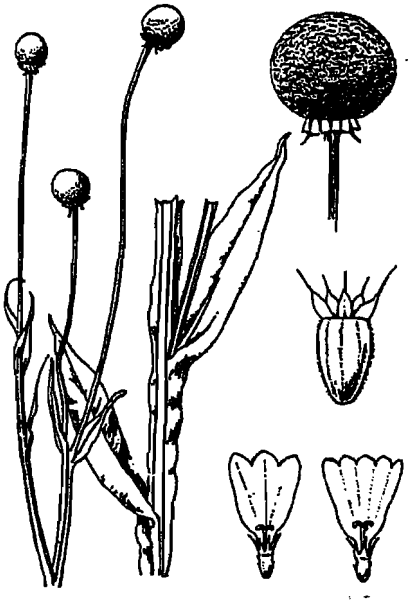
Gnaphalium canescens microcephalum

Gnaphalium luteo-album

Gnaphalium stramineum



Hazardia squarrosa



Helenium puberulum

HELENIUM. SNEEZEWEED, SNAKEWEED.

About 35 species of the Americas.

Helenium puberulum deCandolle. ROSILLA (p. 45). *HABIT*: annual to short-lived perennial herbs with erect stems ranging from about 3 to 15 dm. (1-5') tall. *LEAVES*: alternate, the lower-most petiolate and generally oblanceolate, the upper sessile and strongly decurrent at the base, lance-oblong to linear, and about 3 to 15 cm. long. *INFLORESCENCE*: the ball-like flower-heads are solitary and terminal on peduncles about 9 to 17 cm. long. *HEADS*: round or roundish, about 1 to 1.5 cm. wide, and densely covered with innumerable small disk-flowers with yellow corollas about 2 to 2.7 mm. long. The involucre and ray flowers (if present) are reflexed downward and often nearly concealed, the ligules yellow and about 3 to 8 mm. long. *AKENES*: about 1.2 to 1.9 mm. long and crested by a ring of short-awned pappus scales .4 to 1 mm. long. *OCCURRENCE*: widely scattered in wet habitats in the Tassajara region, but generally uncommon. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, western Transverse and western Peninsular Ranges, from Oregon to northern Baja California. ⊛June-Sept.

HETEROTHECA. GOLDEN ASTER, TELEGRAPH WEED.

About 30 species primarily of western North America.

Heterotheca sessiliflora (Nuttall) Shinners subsp. **echioides** (Bentham) Semple [*Chrysopsis villosa* (Pursh) Nuttall var. *camphorata* (Eastwood) Jepson]. GOLDEN ASTER (p. 48). *HABIT*: aromatic perennial herbs, sometimes slightly woody at the base, with erect branches ranging from about 3 to 8 dm. (1-3') tall. *LEAVES*: alternate and about 1 to 5 cm. long, the larger lower leaves generally oblanceolate and tapering to the base, the upper generally linear-oblong to lanceolate and more or less sessile. *INFLORESCENCE*: terminal and cymose to paniculate. *HEADS*: radiate with yellow ray and disk corollas, the involucres about 8 to 14 mm. long, the ray flowers 3 to 30 with ligules about 3 to 10 mm. long, the disk flowers 30 to 50 and with corollas about 3 to 10 mm. long. *AKENES*: about 2 to 3 mm. long and crested with a ring fine pappus bristles about 4 to 7 mm. long. *OCCURRENCE*: widespread and locally common in open habitats in the Tassajara region. *DISTRIBUTION*: Coast Ranges, from Sonoma and Solano Counties southward, and central and southern Sierra Nevada Foothills, to the Transverse and Peninsular Ranges, as far south as San Diego Co. *NOTE*: fairly common in this region are densely glandular plants with more or less glabrous disk corolla lobes. Such plants correspond to *H. s. e.* var. *camphorata* (Eastwood) Semple, a taxon which ranges from the Santa Cruz Mts. and Mt. Hamilton region of the Diablo Range to the Santa Lucia Mts. of Monterey Co. ⊛July-Oct.

HIERACIUM. HAWKWEED.

A large and widely distributed genus of about 800 species that is especially well represented in Europe and South America. The ancient Greeks believed that hawks utilized the sap of some European species (260 are listed in Flora Europea) to sharpen their eyesight.

1a. Ligules pale white. Phyllaries glabrous or with only a few long hairs. . . . . ***H. albiflorum.***
1b. Ligules pale yellow. Phyllaries pubescent to hirsute. . . . . ***H. argutum.***

Hieracium albiflorum Hooker. WHITE HAWKWEED (p. 48). *HABIT*: perennial herbs with one to several erect and slender stems ranging from about 4 to 8 dm. (16-32") tall. *LEAVES*: the primarily leaves are basal, oblong to oblanceolate with winged petioles and entire or remotely toothed margins, densely hairy, and about 8 to 15 cm. long. Upper leaves are few, sessile and much reduced in size, and mostly restricted to the lower half of the stems. *INFLORESCENCE*: terminal, open, and cymose to paniculate. *HEADS*: ligulate and 15 to 30 flowered, the involucres about 9 or 10 mm. long, the ligules pale-white and about 3 to 4 mm. long. *AKENES*: reddish-brown, about 2 to 3 mm. long, and crested with white to tawny pappus bristles. *OCCURRENCE*: lightly scattered to locally common in shady woodlands habitats along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge. Although this species was not seen elsewhere in this region, it probably occurs in shady habitats in other areas, especially in Miller Canyon, Bear Basin, and the upper regions of Tassajara and Church Creeks. *DISTRIBUTION*: from Alaska southward, to San Diego Co. on the Pacific Slope, and to Colorado in the Rocky Mountains. ⊛June-Aug.

⇧**Hieracium argutum** Nuttall [*H. a.* var. *parishii* (Gray) Jepson]. YELLOW HAWKWEED (p. 48). *HABIT*: evergreen perennial herbs which annually produce a usually singular and erect stem ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: primarily basal and densely hairy, oblong to oblanceolate with remotely toothed margins, and about 8 to 16 cm. long. Upper leaves are few, reduced, and mostly restricted to the lower half of the stem. *INFLORESCENCE*: an elongated racemose panicle. *HEADS*: ligulate and 14 to 22 flowered, the involucres about 7 to 10 mm. long, the ligules pale-yellow and about 8 mm. long. *AKENES*: dark-brown, about 2.5 mm. long, and crested with sordid pappus bristles. *OCCURRENCE*: widely scattered and locally common in shady or mostly shady habitats in the Tassajara region. *DISTRIBUTION*: outer Coast Ranges and Transverse Ranges, from the Santa Lucia Mountains of Monterey Co. to the San Bernardino Mountains of San Bernardino Co. Also on the northern Channel Islands and in the central Sierra Nevada Foothills. ⊛June-Oct.

HULSEA.

Eight species of western North America.

Hulsea heterochroma Gray. RED-EYED HULSEA (p. 48). *HABIT*: glandular-aromatic perennial or biennial herbs with one to several erect stems ranging from about 4 to 12 dm. (16-48") tall. *LEAVES*: alternate, sessile, and with saliently dentate margins, the lower-most about 10 to 20 cm. long, broadly oblong to oblanceolate and produced in rosettes, the cauline gradually becoming reduced upward, the middle generally oblanceolate to obovate, the upper broadly to narrowly elliptic. *INFLORESCENCE*: terminal and cymose to paniculate. *HEADS*: radiate, the involucres about 10 to 20 mm. long and 10 to 15 mm. wide, the ray flowers numbering about 30 to 60, the narrow corollas reddish-purple to red and about 6 to 10 mm. long, the disk flowers many and with yellow corollas about 5 to 9 mm. long. *AKENES*: cylindrical, hairy, about 6 to 8 mm. long, and crested with two unequal pairs of pappus scales less than 3 mm. long. *OCCURRENCE*: scattered in openings in chaparral and woodlands on the higher ridges of the Tassajara region, such as along the crest of Black Butte Ridge and along the Black Cone Trail between Pine Ridge and the Elephant's Back. *DISTRIBUTION*: mostly between 950

to 2,500 m. (3,100 to 8,200 ft), from the Mt. Hamilton region (Santa Clara Co.) southward in the Coast Ranges, and from the Lake Tahoe region southward in the Sierra Nevada, to the Transverse Ranges, the San Jacinto Mts. (western Riverside Co.) and Palomar Mt. (San Diego Co.), and scattered eastward through the mountains of southern Nevada to southwestern Utah. ⊛June-Sept.

HYPOCHOERIS. CAT'S EARS.

About 50 species of Eurasia, North Africa and South America.

***Hypochoeris glabra** Linnaeus. SMOOTH CAT'S-EARS (p. 48). *HABIT*: small annual herbs with erect, leafless, and simple or upwardly branched stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: produced in basal rosettes, mostly oblong-oblanceolate to oblong-spatulate with entire or irregularly toothed margins, and about 1 to 10 cm. long. *INFLORESCENCE*: the flower-heads are singular and terminal. *HEADS*: ligulate, the involucres about 12 to 16 mm. long, the flowers generally many and with yellow ligules scarcely exceeding the involucre. *AKENES*: up to 4 mm. long and crested with feather-like pappus bristles about 9 mm. long. *OCCURRENCE*: scattered in open habitats in the Tassajara region, and locally common in areas with poor, compacted, or disturbed soils, especially in areas that have had more exposure to human activities. *DISTRIBUTION*: a common weed along the Pacific Coast of North America; native to Europe. *NOTES*: although this species is most commonly glabrous throughout, all of the closely observed plants from this region had a remote scattering of stiff hairs on the leaves. According to Flora Europaea (Tutin et. al., '64-'80), such plants represent a rare form of the species. Spelled as *Hypochaeris* in the Jepson Manual ('93). ⊛ March-June.

LACTUCA. LETTUCE.

About 100 species of temperate regions, and the source of the many varieties of the common leafy vegetable.

***Lactuca serriola** Linnaeus. PRICKLY LETTUCE (p. 48). *HABIT*: coarse annual herbs with erect stems ranging from about 6 to 15 dm. (2-5') tall. *LEAVES*: alternate and up to 16 cm. long, sessile with clasping bases and spiny-toothed margins, the lower leaves larger and mostly oblong to oblong-lanceolate or oblanceolate in outline and pinnately few lobed, the much reduced upper-most leaves unlobed and generally lanceolate. *INFLORESCENCE*: the flower heads are terminal and axillary on the branches of an open panicle. *HEADS*: ligulate and 14 to 20 flowered, the involucres about 10 to 12 mm. long, the ligules pale yellow. *AKENES*: about 6 to 7 mm. long, the body generally oblanceolate and terminating with a long and slender beak; the beak is crested with capillary pappus bristles. *OCCURRENCE*: lightly scattered around the developed area of the hot springs, along Tassajara Road, in the Horse Pasture, etc. *DISTRIBUTION*: a common weed in North America; native to Europe. ⊛May-Sept.

LAGOPHYLLA. HARE-LEAF, RABBIT-LEAF.

Four species of western North America. All of the species occur in California, and three are endemic to the California Floristic Province.

Lagophylla ramosissima Nuttall. COMMON HARE-LEAF, SLENDER HARE-LEAF (p. 48). *HABIT*: annual herbs with erect and ultimately branching stems ranging from about 2 to 10 dm. (8-40") tall. *LEAVES*: alternate, entire, narrowly oblong to oblong-linear or narrowly oblanceolate, about 2 to 6 cm. long, and covered with dense coat of grayish-silky appressed hairs. The lower-most leaves, which are usually absent by time the plant reaches maturity, are generally linear oblanceolate to linear spatulate, toothed, and up to 12 cm. long. *INFLORESCENCE*: the flower-heads are clustered or solitary at the summit and along the axis of branches of an open panicle. *HEADS*: radiate with pale-yellow ray and disk corollas, the involucre about 4.5 to 7.5 mm. long, the five ray flowers with inconspicuous ligules 3 to 5.5 mm. long, the six disk flowers with corollas about 3.5 to 4 mm. long. The heads open in the late afternoon and close in the morning. *AKENES*: about 2.5 to 4 mm. long, narrowly obovate, and without pappus. *OCCURRENCE*: widely scattered in open and usually grassy habitats in the Tassajara region, but inconspicuous and easily overlooked. *DISTRIBUTION*: western North America, from eastern Washington and Montana to San Diego Co. ⊛May-Oct.

LASTHENIA. GOLDFIELDS.

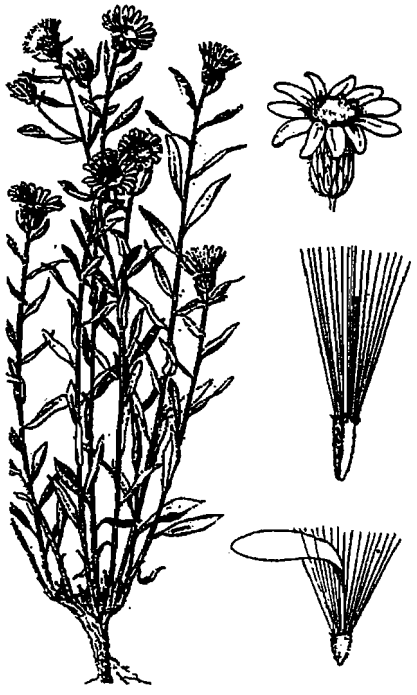
Seventeen species mostly of western North America, but also represented in southwestern South America (Chile). Sixteen species occur in California, and 10 are endemic to the California Floristic Province, while several more are nearly endemic.

Lasthenia californica Lindley [*Baeria chrysostoma* Fischer & Meyer, *B. ch.* subsp. *gracilis* (deCandolle) Ferris, *Lasthenia ch.* (F. & M.) Greene]. GOLDFIELDS, SUNSHINE (p. 48). *HABIT*: small but showy-headed annual herbs with simple or freely branched stems ranging mostly from about 1 to 3 dm. (4-12") tall. *LEAVES*: opposite, sessile, narrowly linear and entire, and usually less than 6 cm. long. *INFLORESCENCE*: the heads are singular and terminal on the stems and branches. *HEADS*: radiate with bright yellow ray and disk-corollas, the involucres about 5 to 10 mm. long, the ray flowers numbering about 6 to 13 and with ligules about 5 to 10 mm. long, the disk flowers many and with five-lobed corollas. *AKENES*: about 2 to 3 mm. long and mostly crested with 1 to 7 slender pappus bristles or awned pappus scales. *OCCURRENCE*: scattered in open and generally grassy habitats at lower to intermediate elevations in the Tassajara region, below about 1075 m. (3,525'), and locally common to abundant in some years. *DISTRIBUTION*: Coast Ranges and Sierra Nevada Foothills, from southwestern Oregon to northwestern Baja California. Also on the Channel Islands and the islands off the coast of Baja California, in Arizona, and perhaps in Sonora Mexico. ⊛March-May.

LAYIA.

About 14 species, all of which occur in California, and all except for one are endemic to the California Floristic Province.

⇕Layia pentachaeta Gray. SIERRAN LAYIA (p. 48). *FORWARD*: although the plants of this region "key-out" to *L. pentachaeta*, their features are generally smaller than those stated for the species as a whole. The following description is based solely on local specimens. *HABIT*: annual herbs with erect or ascending and upwardly branching stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: alternate, the lower up to 4 cm. long, narrowly oblong to oblanceolate in outline and pinnately lobed, the upper reduced, linear to nar-



Heterotheca sessiliflora

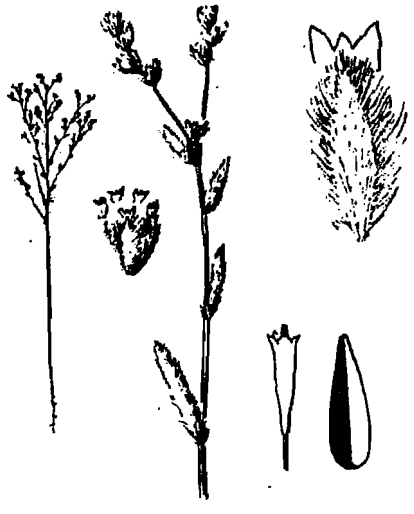
Hieracium albiflorum

Hieracium argutum

Hulsea heterochroma

Hypochoeris glabra

Lactuca serriola



Lagophylla ramosissima

Lasthenia californica

Layia pentachaeta

rowly lanceolate, and entire. *Inflorescence*: the flower heads are singular and terminal on the branches. *Heads*: radiate, the ray and disk corollas deep yellow, the involucres about 4 to 7 mm. long and widely spreading in maturity, the ray corollas about 3 to 6 mm. long and with three-lobed ligules about 2 to 4 mm. long and often nearly as wide, the disk corollas about 3 to 5 mm. long. *Akenes*: about 2.5 to 4 mm. long, the ray akenes compressed front to back, without pappus, and surrounded by a phyllary, the disk akenes narrowly obconic and crested with slender pappus bristles that have an understory of plumose capillary hairs. *Occurrence*: known from only two sites in the Tassajara region: in grassy areas along the Church Creek Trail between Wildcat Camp and The Mesa, and in an opening in chaparral along Tony's Trail, about two-thirds of the way to the summit if one is coming from the hot springs. *Distribution*: Sierra Foothills, from Placer Co. to Kern Co., and on the plains of the southern San Joaquin Valley, extending as far west as the Temblor Range of western Kern Co. and eastern San Luis Obispo Co. *Notes*: the local plants may represent the same entity which Matthews ('97) described as yellow-rayed form of *L. glandulosa* that "is reported in the high Santa Lucia Mtns." Although the local plants are smaller than the typical species, they "key-out" to *L. pentachaeta* in having pappus crested disk akenes, radiate heads, chaff scales of only one series between the ray flowers and disk flowers, pappus of plumose bristles that are not woolly on the inner surface and that are not readily deciduous, and in having dark yellow anthers. ⊛April-June.

LESSINGIA

Fourteen species of the southwestern the United States and northern Baja California, 13 of which are endemic to the California Floristic Province.

1a. Annual herbs. Lower leaves narrowly oblanceolate to oblong in outline and pinnately lobed. Heads discoid and with yellow corollas (the marginal disk-flowers are somewhat enlarged and may at first be mistaken for rays); phyllary tips with prominent resin glands. . . ***L. glandulifera***.

1b. Perennial herbs. Lower leaves oblanceolate to obovate and entire or upwardly toothed. Heads radiate with violet to purple ligules and yellow disk corollas; phyllary tips dark but not gland-tipped. . . . . ***L. filaginifolia***.

Lessingia filaginifolia (Hooker & Arnott) Lane [*Corethrogyne f.* (H. & A.) Nuttall var. *virgata* (Bentham) Gray; *C. f.* var. *rigida* Gray]. California Aster (p. 51). *Habit*: woolly perennial herbs, sometimes slightly woody at the base, with erect or ascending stems ranging from about 4 to 12 dm. (16-48") tall. *Leaves*: alternate, the lower petiolate and up to 6 cm. long, the blades spatulate to oblanceolate and sometimes toothed towards the apex, the upper leaves becoming reduced in size, the upper-most lanceolate to linear, sessile, and often less than 1 cm. long. *Inflorescence*: corymbosely branched and few to many-headed terminal panicles. *Heads*: radiate, the involucres about 6 to 13 mm. long, the ray flowers numbering about 10 to 40 and with corollas about 10 to 12 mm. long, the violet to purple ligules about as long to much longer than the tubes, the disk-flowers numbering about 30 to 120 and with yellow corollas about 4 to 6 mm. long. *Akenes*: about 3 to 5 mm. long and crested with reddish-brown pappus bristles. *Occurrence*: widely scattered in the Tassajara region, and locally common in semi-open woodlands and grassy openings in chaparral. *Distribution*: Coast Ranges, southern Sierra Nevada, Transverse and Peninsular Ranges, from Alameda and Santa Cruz Counties and Kern Co. to northern Baja California. Also on the Channel Islands. *Note*: the heads of the local plants, with involucres mostly about as long as wide and with disk corollas about 6 mm. long, are very similar to the heads of *L. f.* var. *californica* (deCandolle) Lane. ⊛July-Dec.

Lessingia glandulifera Gray [*L. germanorum* Chamisso var. *glandulifera* (G.) J. T. Howell; *L. germ.* var. *tenuipes* J. T. Howell]. Sticky Lessingia, Valley Lessingia (p. 51). *Habit*: aromatic and usually much branched annual herbs ranging from about 1 to 7 dm. (4-28") tall. *Leaves*: alternate, narrowly oblanceolate to oblong in outline, the lower-most deciduous, sometimes bipinnately lobed, and up to 10 cm. long, while the upper leaves are pinnately lobed and mostly about 1 to 3 cm. long. The upper-most leaves are reduced to bract-like structures with tack-like glands at the apex. *Inflorescence*: cymose to paniculate with the flower-heads singular and terminal on the branches. *Heads*: discoid, the involucres about 5 to 8 mm. long, the phyllaries with prominent tack-like glands, the flowers numbering about 15 to 30, the corollas yellow, the outer often enlarged and can be at first mistaken for ligules. *Akenes*: about 2 to 3 mm. long and crested by fine pappus bristles. *Occurrence*: widely scattered on open and usually grassy slopes at all elevations of the Tassajara region, but generally uncommon. *Distribution*: Coast Ranges and valleys, Central Valley, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from the San Francisco Bay Area and Placer Co. to northern Baja California. ⊛May-Nov.

MADIA. Tarweed, Gumweed.

About 21 species of western North America and southwestern South America (Chile and Argentina). Eighteen species occur in California (not including lesser taxa), and 11 are endemic to the California Floristic Province.

1a. Perennial herbs. Pappus present in disk and sometimes ray flowers. Locally found only in densely forested areas at higher elevations. . . ***M. madioides***.

1b. Annual herbs. Pappus absent. Mostly widely distributed in this region in open and/or shady habitats:

2a. Plants small and very inconspicuous. Disk flowers 1 or 2 per head, ray flowers 5 to 8, the ligules not exceeding 1 mm. in length. . . ***M. exigua***.

2b. Plants larger and more conspicuous. Disk flowers more than 15 per head, ray flowers 5 to 20, the ligules 2 to 20 mm. long:

3a. Lateral flower-heads mostly subsessile or on peduncles shorter than the head. Disk-flowers fertile (perfect). Ray flowers 8 to 12, the ligules 2 to 8 mm. long. . . . . ***M. gracilis***.

3b. Lateral flower-heads mostly produced on peduncles longer to much longer than the head. Disk-flowers sterile (staminate). Ray flowers mostly 8 to 20, the ligules 6 to 20 mm. long:

4a. Non-xerophytic plants (flowering mostly from March to June) that are not densely glandular below the inflorescence. Phyllary tips about as long as the phyllaries. . . . . ***M. elegans vernalis***.

4b. Xerophytic plants (flowering mostly from June to October or November) that are densely glandular nearly throughout. Phyllary tips about as long to longer than the phyllaries:

5a. Stems relatively slender and not densely foliated at or towards the base (the leaves not imbricated). Phyllary tips about as long as the phyllaries. Ligules about 6 to 15 mm. long. Occurring mostly above 3,000 ft. . . . . ***M. elegans elegans.***

5b. Stems relatively stout and very densely foliated at the base (the leaves well imbricated). Phyllary tips longer than the phyllaries. Ligules about 10 to 20 mm. long. Occurring mostly below 3,000 ft. . . . . ***M. elegans densifolia.***

Madia elegans D. Don. ELEGANT MADIA, COMMON MADIA (p. 51). *HABIT*: Xerophytic and glandular-aromatic annual herbs with erect stems ranging from about 1 to 9 dm. (4-36") tall. *LEAVES*: alternate, narrowly lanceolate to linear, the larger at or near the base and up to 12 cm. long, the upper becoming increasingly reduced in size. *INFLORESCENCE*: terminal cymes with the flower heads borne on peduncles about as long to much longer than the heads. *HEADS*: radiate with yellow ray corollas and yellow or sometimes reddish disk corollas, the ray flowers numbering about eight to sixteen and with ligules about 6 to 15 mm. long (which are deeply three-lobed at the apex), the up to 25 or more disk flowers smaller and staminate. *AKENES*: ray akenes are laterally flattened, about 2.5 to 5 mm. long, without pappus, and nearly enclosed by the phyllaries. Disk akenes remain undeveloped. *OCCURRENCE*: widely scattered at higher elevations in the Tassajara region, mostly in grassy openings in woodlands and chaparral, and occasionally (but rarely) below about 900 m. (3,000') elevation. *DISTRIBUTION*: widely distributed in the mountains of California, mostly above about 1,000 m. (3,200') elevation. ⊛June-Oct. (-Nov.).

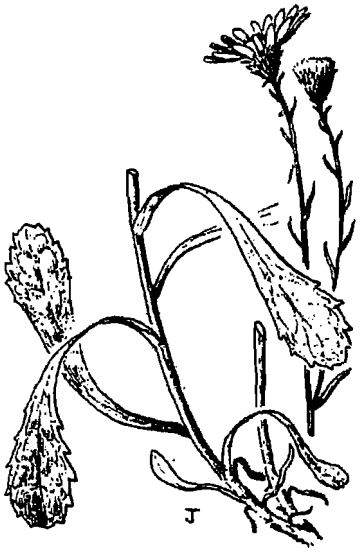
Madia elegans subsp. **densifolia** (E. Greene) Keck (p. 51). *HABIT*: xerophytic annual herbs much like the typical species, but with generally stouter stems which are much more densely foliated at the base (the leaves are mostly ascending and well imbricated), flower-heads averaging about 2 mm. longer and with ligules up to 2 cm. long, and phyllaries which are terminated by slender tips exceeding the length of the main body. The plants also tend to be taller to much taller (to 2+ m.). *OCCURRENCE*: widely scattered in the Tassajara region, and occurring mostly in grassy openings in woodlands and chaparral. *DISTRIBUTION*: scattered nearly throughout cismontane California, mostly below 3,000 ft., and extending northward into Oregon. *NOTE*: spring-flowering plants which in most aspects correspond to this taxon are often encountered in this region. Such plants probably represent intermediates between the subspecies *densifolia* and *vernalis*. ⊛July-Oct. (-Nov.).

Madia elegans subsp. **vernalis** Keck (p. 51). *HABIT*: annual herbs much like the typical species, except in being non-xerophytic (flowering from early to late spring and withering with the onset of the dry season), in being generally less glandular, and with generally larger and showier flower-heads with ligules up to 2 cm. long. *OCCURRENCE*: common and often abundant at lower to intermediate elevations in the Tassajara region, especially in shady or semi-shady woodland habitats. *DISTRIBUTION*: apparently widely scattered in California (re. Keil in the Jepson Manual '93), but mostly from Oregon to San Luis Obispo Co. in the Coast Ranges, and to Kern Co. in the Sierra Foothills. The plants occur mostly below 1,000 m. (3,280'). ⊛March-June.

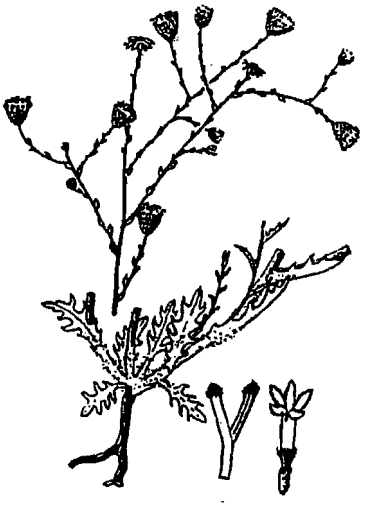
Madia exigua (Smith) Gray. THREAD-STEM MADIA, LITTLE TARWEED (p. 51). *HABIT*: small annual herbs with erect and very slender stems ranging from about .5 to 3 dm. (2-12") tall. *LEAVES*: alternate, narrowly linear, and about 1 to 4 cm. long. *INFLORESCENCE*: the heads are small and borne in corymbose panicles, the peduncles filiform and about 1 to 4 cm. long. *HEADS*: radiate with pale yellow corollas, the usually five to eight ray flowers with ligules about 1.3 to 2 mm. long (inclusive of the tube), the one or rarely two disk flowers have corollas about 1.3 to 1.8 mm. long. *AKENES*: about 1.5 to 2.9 mm. long and without pappus, the disk akene(s) obovoid, the ray akenes laterally flattened, swollen to one side, and nearly enclosed within glandular phyllaries. *OCCURRENCE*: widely but lightly scattered in open grasslands and grassy openings in chaparral in the Tassajara region, but inconspicuous and easily overlooked. I have seen this species only in grasslands along the Horse Pasture trail (in the Horse Pasture proper and above Tassajara Rd.), in grassy openings in chaparral along Tony's Trail, and in Pine and Strawberry Valleys. *DISTRIBUTION*: from British Columbia and Montana to northern Baja California. *NOTE*: Howitt & Howell's listing of "Tassajara Springs" as a Monterey Co. site for this species was based on one of Junea Kelly's "Tassajara Springs" specimens of June, 1917 (CAS). ⊛May-July.

Madia gracilis (Smith) Keck [*M. dissitiflora* (Nuttall) Torrey & Gray]. SLENDER TARWEED, GUMWEED (p. 51). *HABIT*: glandular-aromatic annual herbs with leafy stems ranging from about 1 to 10 dm. (4-40") tall. *LEAVES*: the lower mostly opposite and the upper alternate, linear or oblong-linear or sometimes slightly oblanceolate, the lower and middle up to 10 cm. long, the upper-most reduced in size. *INFLORESCENCE*: racemose to paniculate, with the terminal flower-heads sometimes clustered and the lateral sessile to short-pedunculate. *HEADS*: radiate and with yellow ray and disk corollas, the three to nine ray flowers have ligules about 1.5 to 8 mm. long, while the two to twelve disk flowers have corollas 3 to 5 mm. long. *AKENES*: generally alike (but the ray akenes are nearly enclosed within bract-like phyllaries), about 2.8 to 5 mm. long, black, laterally flattened, slightly bowed, and without pappus. *OCCURRENCE*: widespread and locally common to abundant in the Tassajara region, particularly in grassy openings in woodland areas. *DISTRIBUTION*: from British Columbia and Montana to northern Baja California; also native to Chile and Argentina. ⊛April-Oct.

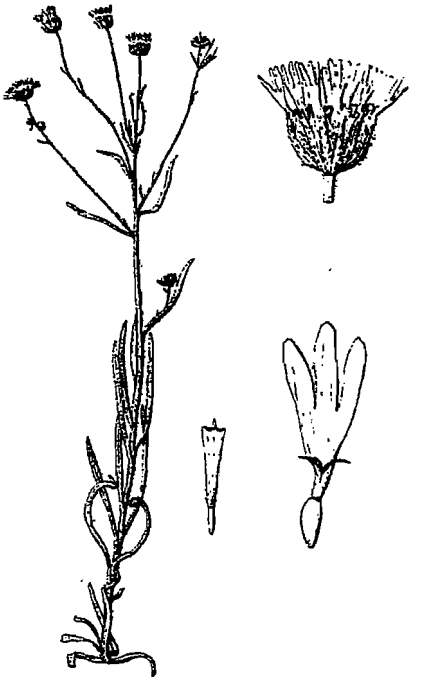
⇩**Madia madioides** (Nuttall) Greene. WOODLAND MADIA, MADIA-LIKE MADIA (p. 51). *HABIT*: perennial herbs with erect stems ranging from about 2 to 7 dm. (8-28") tall. *LEAVES*: linear to linear-oblong, entire or remotely toothed, and about 6 to 12 cm. long. The basal leaves are produced in spreading rosettes, the cauline leaves are opposite and ascending, and the upper-most leaves are alternate and reduced. *INFLORESCENCE*: terminal and somewhat racemose or cymose, the flower-heads few and long-peduncled. *HEADS*: radiate with involucres about 4 to 6 mm. long, the ray and disk corollas are yellow, the approximately 8 to 15 ray-flowers fertile and with ligules about 4 to 10 mm. long which are deeply three-lobed at the apex, the disk flowers staminate, numbering about 10 to 30, and with corollas about 4 to 5 mm. long. *AKENES*: the fertile akenes of the ray flowers are about 3 to 5 mm. long, laterally compressed and somewhat bowed, and without pappus or with a crown of minute pappus scales, while the sterile akenes of the disk flowers are about 3 or 4 mm. long and crested with fringed pappus scales no more than 1 mm. long. *OCCURRENCE*: lightly scattered in the shade of the more densely forested areas of the Tassajara region, such as along the Pine Ridge trail between the Church Creek Divide and Pine Ridge, on Chew's Ride, and in Miller Canyon. *DISTRIBUTION*: Pacific Slope, from British Columbia to the Santa Lucia Mts. of northwestern San Luis Obispo County. Also in the northern Sierra Nevada. ⊛May-September.



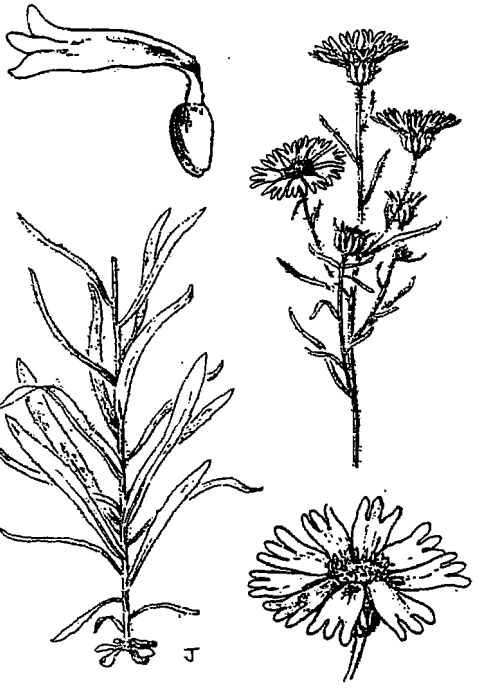
Lessingia filaginifolia



Lessingia glandulifera



Madia elegans elegans



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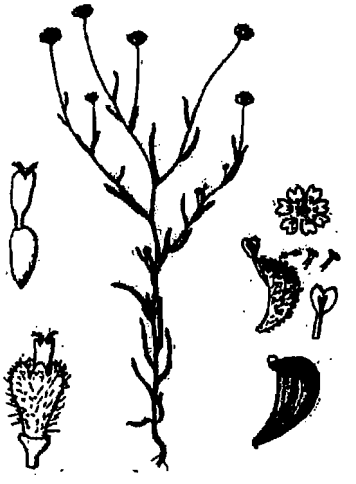
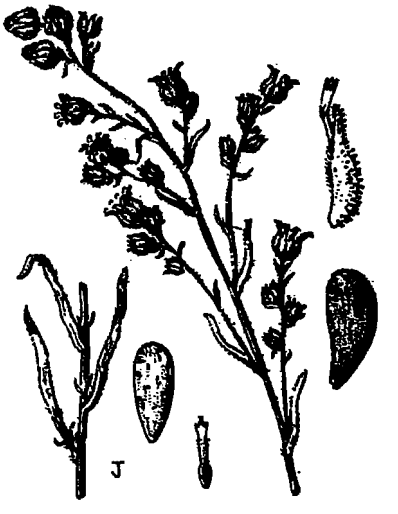


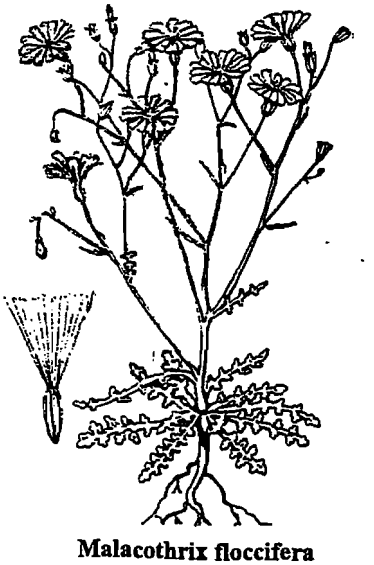
Madia exigua



Madia gracilis

Madia madioides

Malacothrix clevelandii



Malacothrix floccifera

MALACOTHRIX.

About 21 species of western North America and southern South America. Fourteen species occur in California (not including lesser taxa), and eight are endemic to the California Floristic Province.

1a. Ligules pale yellow, the outer generally exserted beyond involucre less than 5 mm. Akenes 15-lined with one or two persistent pappus bristles. . . . . ***M. clevelandii.***

1b. Ligules generally white (or yellowish or pinkish), the outer exserted beyond involucre more than 5 mm. Akenes 5-ribbed with all pappus bristles readily deciduous. . . . . ***M. floccifera.***

Malacothrix clevelandii Gray (p. 51). *HABIT*: annual herbs usually with several slender stems from the base that range from about 1 to 4 dm. (4-16") tall. *LEAVES*: primarily basal, oblong to broadly linear in outline with pinnately lobed margins, and about 1 to 10 cm. long. Upper leaves are few and greatly reduced in size. *INFLORESCENCE*: paniculately branched, with the flower-heads singular on slender peduncles. *HEADS*: ligulate, the corollas are pale-yellow and about 4.5 to 7.5 mm long. *AKENES*: linear-oblong, about 1.2 to 1.8 mm. long, light brown, and crested with capillary pappus bristles, all except for one or two readily falling away. *OCCURRENCE*: although I have seen this rather inconspicuous species only in openings in chaparral at and near the summit of Tony's Trail, and a single plant was found by Vern Yadon on the summit of Black Butte in May of 1980 (Yadon '80a), this often noted "burn-species" is probably more widely scattered and perhaps locally common during the first few years after a fire. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Glenn and El Dorado Counties to northern Baja California, and eastward to Utah and Arizona. Also on Santa Rosa Island. *NOTE*: the only other report of this species in the Tassajara region that I am aware of is also from the summit of Tony's Trail. According to the note enclosed in the envelope pasted to A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3172 DS), Elmer collected it at the "Divide between Springs & Willow Cr." ⊕April-June.

Malacothrix floccifera (deCandolle) Blake [*M. obtusa* Bentham]. WOOLLY MALACOTHRIX (p. 51). *HABIT*: annual herbs with one to several erect or ascending stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: mostly basal, oblong to oblanceolate in outline and with pinnately lobed margins, often with tufts of woolly hair at the base and between the lobes, and about 2 to 8 cm. long. Upper leaves are few and much reduced in size. *INFLORESCENCE*: irregularly paniculate. *HEADS*: ligulate and with white or sometimes yellowish or pinkish-tinged corollas about 7 to 15 mm. long. *AKENES*: about 1.2 to 2 mm. long and crested by a ring of fine and readily deciduous pappus bristles. *OCCURRENCE*: according to Vern Yadon ('80c), this species was found along the Black Cone Trail between South Ventana Cone and the Elephant's Back in July of 1980. As this is a noted "burn-species" which has been reported from other localities near to the Tassajara region (Howitt & Howell '64; Griffin '75), it is probably more widely scattered in this region. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Siskiyou Co. to Ventura Co., and southward to at least Mariposa Co. in the Sierra Nevada. *NOTE*: A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3155 DS) was actually collected, according to the note en-closed in an envelope pasted to the specimen sheet, in Lost Valley. ⊕April-July.

MICROPUS.

Five species of annual herbs. Three are native to the Mediterranean Sea region, and two are endemic to the California Floristic Province.

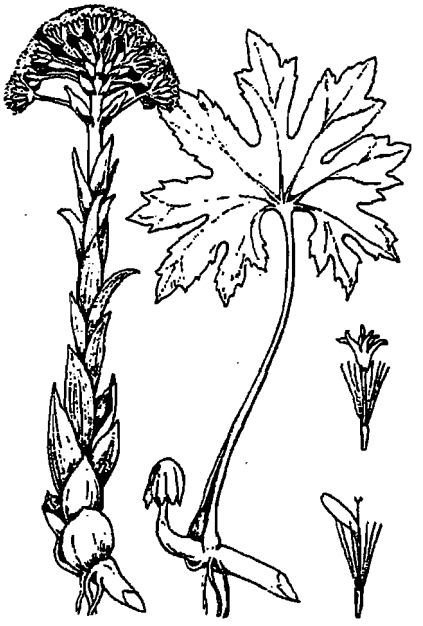
Micropus californicus Fischer & Meyer. MOUSE-TAIL, CALIFORNIA COTTONWEED, SLENDER COTTONWEED (p. 53). *HABIT*: woolly annual herbs with slender and erect stems ranging from about .5 to 3.5 dm. (2-14") tall. *LEAVES*: alternate, linear-oblong with entire margins, and about .5 to 1.5 cm. long. *INFLORESCENCE*: flower-heads are produced singularly or in small clusters at or near the summit of the stems. *HEADS*: discoid, the 4 to 6 outer flowers are pistillate and enclosed in a gibbous and densely white-woolly bract (from which the minute corollas and pistils are exserted through a tiny lateral slit), while the 2 to 5 disk flowers are staminate and with corollas about 1 to 2 mm. long. *AKENES*: pistillate (fertile) akenes are about 1.4 to 2.6 mm. long, laterally compressed and swollen on the back side, and without pappus, while the vestigial sterile akenes of the disk flowers often have one deciduous pappus bristle. *OCCURRENCE*: widespread in the Tassajara region, and locally common to abundant in open areas at lower to intermediate elevations, especially in places were the soil is poor, disturbed, or compacted. *DISTRIBUTION*: scattered nearly throughout cismontane California below about 1700 m. (5575'), from southwestern Oregon to northern Baja California. ⊕April-June.

PETASITES. COLT'S-FOOT.

Fifteen species of North America and Eurasia.

⇩**Petasites frigidus** Linnaeus **var. palmatus** (Aiton) Cronquist [*P. p.* (Aiton) Gray]. WESTERN COLT'S-FOOT (p. 53). *HABIT*: perennial herbs of wet riparian habitats with rhizomes that send up flowering stems in advance of the primary leaves. The stems arise in early spring and range from about 2 to 6 dm. (8-24") tall. *LEAVES*: the large primary leaves arise in late spring on petioles about 1 to 4 dm. long, the blades generally roundish to reniform in outline, about 1 to 4 dm. wide, and palmately cleft into 7 to 10 deep lobes. The bract-like leaves of the flowering stems are generally lanceolate and upwardly appressed or ascending. *INFLORESCENCE*: the flower-heads are numerous in racemose to corymbose and often convex terminal clusters. *HEADS*: radiate and with whitish or pinkish-tinged ray and disk corollas, the involucres are about 5 to 9 mm. wide, the pistillate ray flowers with inconspicuous ligules about 2 to 7 mm. long, the disk flowers staminate and with corollas about 3.5 to 5 mm. long. Some heads have mostly pistillate flowers while others have mostly staminate flowers. *AKENES*: about 3 to 4.5 mm. long, 5 to 10 ribbed, and crested with soft white pappus bristles about 6 to 13 mm. long. *OCCURRENCE*: fairly common in deeply shady areas along the perennial streams of the Tassajara region below about 760 m. (2,500') elevation. *DISTRIBUTION*: from Alaska southward, to the Santa Lucia Mts. along the Pacific Slope, and eastward, through Canada, to New England. ⊕March-April.

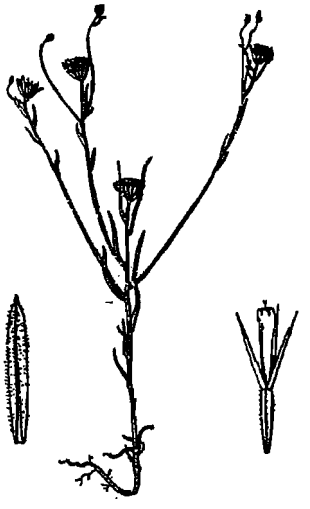
Micropus californicus



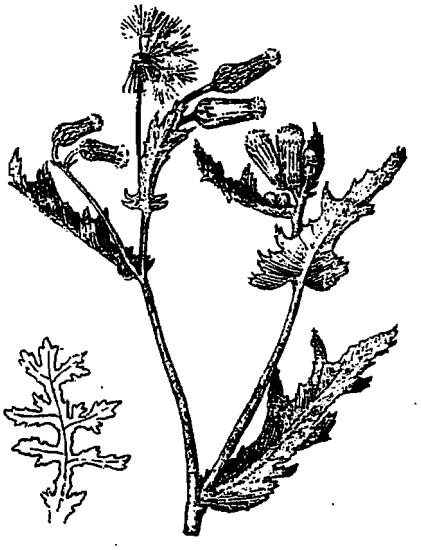
Petasites frigidus

Psilocarphus tenellus

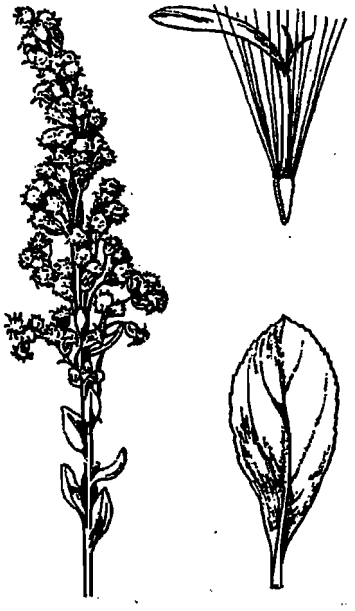
Rafinesquia californica



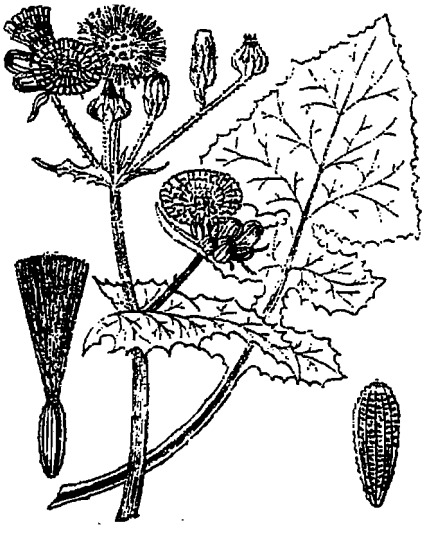
Rigiopappus leptocladus



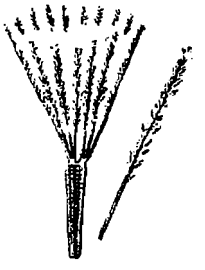
Senecio vulgaris



Solidago californica



Sonchus oleraceus



Stephanomeria virgata

PSILOCARPHUS. WOOLLY-ROUND-HEADS, ROUND WOOLLY MARBLES.

About three to five species of western temperate North America and western temperate South America (central Chile).

Psilocarphus tenellus Nuttall (p. 53). *HABIT*: small and woolly annual herbs with several semi-prostrate stems ranging from about 2 to 10 cm. (1-4") long; the plants usually form small tufts. *LEAVES*: opposite, spatulate to oblong, and about 4 to 15 mm. long. *INFLORESCENCE*: the flower-heads are terminal and axillary and singular or in few-headed clusters. *HEADS*: discoid, the outer pistil-late flowers numbering up to 45 and surrounded by woolly bracts, the inner staminate flowers naked and numbering from about 2 to 10. *AKENES*: the fertile akenes of the pistillate flowers are about .6 to 1.2 mm. long, while the sterile akenes of the staminate flowers are vestigial, and none are crested with pappus. *OCCURRENCE*: scattered on clay-loamed soils in the Horse Pasture, and occurring mostly in flat or relatively flat places with compacted soils, and sometimes in trail beds. *DISTRIBUTION*: from British Columbia and Idaho to northern Baja California. ⊛April-June.

RAFINESQUIA.

Two species of annual herbs of the southwestern United States and adjacent northern Mexico.

Rafinesquia californica Nuttall. CALIFORNIA CHICORY (p. 53). *HABIT*: annual herbs with erect and upwardly branching stems ranging from about 2 to 15 dm. (8-60") tall. *LEAVES*: alternate, about 2 to 20 (or 30) cm. long, and becoming reduced in size and complexity upward on the stems. The lower and middle leaves are generally oblong to elliptical in outline and regularly or irregularly pinnately lobed, the lower on winged petioles and the middle with sessile and clasping bases, the uppermost greatly reduced, oblong to lanceolate and with toothed margins. *INFLORESCENCE*: the relatively large flower-heads are terminal on the branches or branchlets of an open panicle. *HEADS*: ligulate and about 15 to 30 flowered, the involucres about 14 to 20 mm. wide, the ligules white, about 5 to 8 mm. long, and slightly exceeding the phyllaries. *AKENES*: about 4 or 5 mm. long with slender beaks about 5 to 7 mm. long, and crested with numerous capillary pappus bristles. *OCCURRENCE*: widely scattered in open or mostly open habitats at lower to intermediate elevations in the Tassajara region, but generally uncommon. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Humboldt Co. and Kern Co. to northern Baja California, and eastward to Arizona and Utah. *NOTE*: this species is noted for its preference for disturbed habitats, and is especially common after fires. ⊛April-July.

RIGIOPAPPUS. RIGID-PAPPUS SLENDER-STEM, WIREWEED.

One species of western North America.

Rigiopappus leptocladus Gray (p. 53). *HABIT*: small annual herbs with erect and very slender stems ranging from about 1 to 3 dm. (4-12 in.) tall. *LEAVES*: alternate, narrowly linear, and about 1 to 3 cm. long. *INFLORESCENCE*: the heads are singular and terminal on the primary stem and the lateral and generally over-topping branches. *HEADS*: radiate, the ray and disk corollas pale yellow, the involucres about 5 to 8 mm. long, the ray flowers numbering about 5 to 15 and with corollas about 3 to 5 mm. long, the ligules inconspicuous and less than half as long as the tube, the disk flowers numbering from about 5 to 35 and with narrowly tubular corollas about 2 to 3 mm. long. *AKENES*: linear, about 3 to 5 mm. long, and crested by 3 to 5 narrow and rather rigid pappus scales. *OCCURRENCE*: scattered in grassy habitats in the Tassajara region, but inconspicuous and thus easily overlooked. *DISTRIBUTION*: from Washington and Idaho southward, through the Coast Ranges and Sierra Nevada, to the San Gabriel and western Transverse Ranges of southern California. Also in Utah. ⊛April-June.

SENECIO. GROUNDSEL, BUTTERWEED, RAGWORT.

With about 1,500 species worldwide, *Senecio* is one of the largest genera of vascular plants. Although about 36 species are native to California, the only known representative in the Tassajara region is an introduced weed.

***Senecio vulgaris** Linnaeus. COMMON GROUNDSEL, OLD MAN IN THE SPRING, COMMON BUTTERWEED (p. 53). *HABIT*: annual herbs with simple to diffusely branched stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: alternate and about 2 to 10 cm. long, the larger lower leaves petiolate and generally pinnately lobed, the middle to upper sessile and with clasping bases, the margins pinnately or irregularly jagged. *INFLORESCENCE*: the flower heads are produced in loose cymose panicles. *HEADS*: discoid, the involucres about 5 to 8 mm. long, the disk corollas yellow and not much longer than the phyllaries. *AKENES*: about 1.5 to 2.5 mm. long and crested with fine pappus bristles. *OCCURRENCE*: lightly scattered along Tassajara Rd. and some trails, in or around developed areas, etc. *DISTRIBUTION*: a common weed in North America, native to Europe. ⊛April-Nov.

SOLIDAGO. GOLDEN ROD.

About 150 species primarily of North America, but also of South America and Eurasia.

Solidago californica Nuttall. CALIFORNIA GOLDEN ROD, OROJO DE LIEBRE (p. 53). *HABIT*: rhizomatic perennial herbs producing erect or ascending stems ranging from about 2 to 12 dm. (8-48") tall. *LEAVES*: alternate, the lower spatulate to oblong-obovate and about 5 to 12 cm. long, the bases attenuate and the margins serrate, the upper becoming reduced, the upper-most much reduced and generally elliptic, sessile, and with entire margins. *INFLORESCENCE*: the flower heads are small and produced in abundance in elongated spike-like and generally one-sided panicles, or sometimes in short and generally pyramidal panicles. *HEADS*: radiate with yellow ray and disk corollas, the involucres about 3 to 5 mm. long, the ray flowers numbering about 6 to 11 and with inconspicuous ligules about 3 to 5 mm. long, the disk flowers numbering about 6 to 17 and with corollas about as long as the ligules. *AKENES*: about .7 to 1.5 mm. long and crested with a ring of fine pappus bristles. *OCCURRENCE*: widespread in the Tassajara region, and locally common to abundant in woodlands, grasslands and openings in chaparral. This is one of the most conspicuous of the regions plant species when flowering (from about mid-summer to mid-fall). *DISTRIBUTION*: from southwestern Oregon to northern Baja California. ⊛July-Oct.

SONCHUS. Sow Thistle.

About 54 species of Eurasia and Africa.

***Sonchus oleraceus** Linnaeus (p. 53). *Habit*: coarse annual herbs ranging from about 5 to 1.2 dm. (20-48") tall. *Leaves*: alternate and up to 35 cm. long, lyrate-pinnatifid into generally falcate-lanceolate lobes with a triangular to deltoid terminal section, the margins spiny toothed, the lower leaves generally on winged petioles and the upper with sessile and clasping bases, the much reduced upper-most leaves unlobed and generally lanceolate. *Inflorescence*: the flower-heads are produced in irregular corymbs or cymes. *Heads*: ligulate, the involucres about 10 to 13 mm. long, the ligules yellow and as long as the tube. *Akenes*: about 2 to 3 mm. long and crested with capillary pappus bristles. *Occurrence*: lightly scattered in areas in the Tassajara region that have had more contact with human activities, such in and around developed areas, in the Horse Pasture, along Tassajara Rd, along trails, at campsites, etc. *Distribution*: a common weed in temperate North America; native to Europe, North Africa, and western Asia. ⊕April-Nov.

STEPHANOMERIA.

About 24 species of temperate western North America.

Stephanomeria virgata Bentham. Twiggy Wreath Plant (p. 53). *Habit*: xerophytic annual herbs with erect and upwardly branching stems ranging from about 5 to 18 dm. (20-72") tall. *Leaves*: narrowly oblong to spatulate and pinnately lobed, the lower-most the largest (up to 20 cm. long) and produced in rosettes but withering early, the upper alternate, smaller, and somewhat more persistent. *Inflorescence*: the heads are mostly solitary and both terminal and lateral on the rather stiffly ascending branches. *Heads*: ligulate and averaging about 8 or 9 flowers per head, the involucres about 5 to 8 mm. long, the ligules mostly about 7 to 9 mm. long and varying from white to pale lavender or pinkish. *Akenes*: about 2.2 to 3.6 mm. long and crested with about 23 to 28 feather-like and readily deciduous pappus bristles. *Occurrence*: widely scattered in generally open habitats in the Tassajara region, and locally common on grassy slopes and in openings in chaparral. *Distribution*: Coast, Transverse and Peninsular Ranges, from Monterey Co. to northern Baja California. *Note*: although the plants of Monterey Co. have been assigned to *S. v.* subsp. *pleurocarpa* (Greene) Gottlieb (Gottlieb '72, and followed by Howitt & Howell '73 and Matthews '97), Stebbins (re. Jepson Manual '93) has assigned all plants of the south Coast Ranges to the typical species (the distribution stated above follows Stebbins). All of the closely observed plants in the Tassajara region corresponded to the description of the typical species. ⊕July-Oct.

STYLOCLINE. Nest Straw.

Seven species of the southwestern region of the United States and adjacent Mexico. Two of the species may now be extinct.

Stylocline gnaphaloides Nuttall. Everlasting Nest Straw (p. 56). *Habit*: small woolly annual herbs with simple and erect stems or more commonly with several decumbent or ascending stems, the stems ranging from about 5 to 20 cm. (2-8") long. *Leaves*: alternate, linear-oblanceolate to oblong, and about 5 to 12 mm. long. *Inflorescence*: the flower-heads are terminal and axillary and produced singularly or in few-headed clusters. *Heads*: discoid, roundish and about 3 to 6 mm. wide, the outer flowers pistillate and enclosed in bracts that are densely woolly below but translucent and scale-like above, the one or two inner flowers are staminate. *Akenes*: pistillate akenes are about .8 to 1 mm. long and without pappus, the sterile akenes of the disk flowers are no more than .2 mm. long and with one to five pappus bristles less than 2 mm. long. *Occurrence*: widely scattered in open and usually grassy habitats in the Tassajara region, and fairly common in some areas. *Distribution*: Coast, Transverse and Peninsular Ranges, from Lake and Marin Counties to northern Baja California. Also in the San Joaquin Valley and central Arizona. ⊕March-May.

UROPAPPUS.

One species. Often included in *Microseris*.

Uropappus lindleyi (deCandolle) Nuttall [*Microseris lindleyi* (deCandolle) Gray, *M. linearifolia* Schultz-Bipontinus, *U. linearifolius* (deCandolle) Nuttall]. Silver Puffs (p. 56). *Habit*: annual herbs with one to several flowering stems (scapes) ranging from about 1 to 6 dm. (4-24") tall. *Leaves*: about 3 to 30 cm. long, basal or nearly so, narrowly linear and entire (thus grass-like) or with narrow and remote marginal lobes. *Inflorescence*: the flower-heads are singular and terminal on the scapes. *Heads*: ligulate, the involucres about 10 to 40 mm. long, the flowers five to many and with yellow corollas which are shorter to about as long as the phyllaries. The heads become spherical with the maturation of the akenes. *Akenes*: very slender, about 8 to 16 mm. long, and crested with 5 narrowly lanceolate pappus scales about 5 to 15 mm. long, the scales terminating with short capillary awns about 4 to 6 mm. long. *Occurrence*: widespread in open and usually grassy habitats in the Tassajara region, especially in areas with loose or disturbed soils. *Distribution*: widely distributed in western North America, from Washington and Idaho to northern Baja California and western Texas. ⊕April-June.

WYETHIA. Mule-Ears, Compass Plant.

About 14 species of temperate western North America. Ten of the species occur in California, and eight are endemic to the California Floristic Province.

Wyethia helenioides (deCandolle) Nuttall. Gray Mule-Ears, Woolly Mule-Ears (p. 56). *Habit*: perennial herbs from a large and upwardly branching taproot which annually produces generally unbranched stems ranging from about 3 to 7 dm. long. *Leaves*: primarily basal, the petioles about 4 to 10 cm. long, the large blades elliptic to obovate and about 25 to 45 cm. long, and at first densely tomentose but often becoming somewhat glabrous with age. Upper leaves are few and reduced in size. *Inflorescence*: the large flower heads are singular and terminal on the stems, or sometimes the stems are with one or two lateral and axillary heads produced on peduncles about 1 to 6 cm. long. *Heads*: radiate with yellow ray and disk corollas, the involucre about 4 to 7 cm. long, the ray flowers numbering about 13 to 21 and with ligules about 2.5 to 5 cm. long, the disk flowers many and with corollas about 1 cm. long. *Akenes*: about 12 to 15 mm. long and crested by two or more lanceolate to triangular pappus scales about 1 to 5 mm. long. *Occurrence*: light-

ly scattered in generally grassy habitats in woodlands on Chew's Ridge, but not known to occur elsewhere in this region. *DISTRIBUTION*: Coast Ranges, from Tehama and Mendocino Counties to San Luis Obispo County, and the Sierra Foothills, from El Dorado County to Mariposa County. Also on the Sutter Buttes. ⊕March-July.

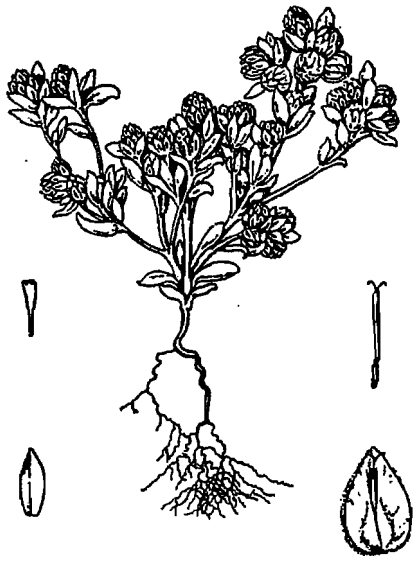
Notes on *Asteraceae*.

The listing of Tassajara Springs as a site for *Senecio douglasii* [*S. flaccidus* var. *douglasii*) by Howitt & Howell ('64, 149) was based on one of Junea Kelly's "Tassajara Springs" specimens of July 1916 (CAS). I was not able to find this taxon in the Tassajara region, although it does occur in the Arroyo Seco area near Santa Lucia Creek. Another specimen which is referable to Tassajara is one of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June, 1901 (Elmer #2978 DS). This specimen is peculiar in that its number places it 136 sheets ahead of the rest of Elmer's known Tassajara Hot Springs collections (3114 to 3415); the note enclosed in an envelope pasted to the specimen sheet appears to read as follows: "near Carmel, below S. H. & River, brushy place."

Very promising habitats exist on talus slopes in the upper drainage of Tassajara Creek (between South Ventana Cone and the Elephant's Back) for *Raillardiopsis muirii*. The only currently known site for this is perennial herb outside of the Sierra Nevada is on talus slopes on Ventana Double Cone. In the Sierra Nevada this rare species occurs only in the watersheds of the Kings and Kaweah Rivers between 4000 and 8200 ft.

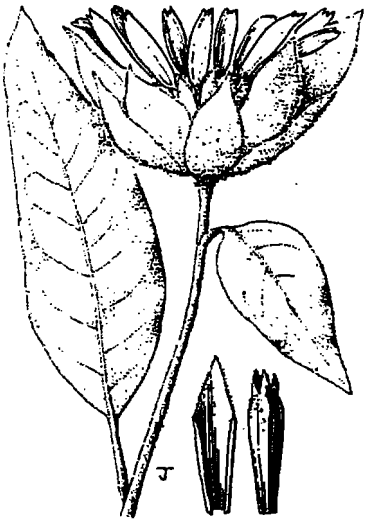
Asteraceae species that have been reported to occur in areas of the Santa Lucia Mountains near or relatively near to the Tassajara Canyon and vicinity, and thus may occur somewhere in this region, include: *Helianthus gracilentus, Hemizonia lobbii, Lessingia tenuis, Stephanomeria elata, S. exigua* subsp. *carotifera*, and *S. e.* subsp. *coronaria*.

Occasional weeds in and about the developed area of Tassajara Hot Springs include: *Chamomilla suaveolens* [*Matricaria matricarioides*] (Pineapple Weed or Rayless Chamomile), *Tanacetum vulgare* (Common Tanzy), and *Silybum marianum* (Milk Thistle).



Stylocline gnaphaloides

Uropappus lindleyi



Wyethia helenioides

BERBERIDACEAE. BARBERRY FAMILY.

About 16 genera and 670 species of shrubs, subshrubs, and perennial herbs of tropical and temperate regions. The family includes the various Barberries and Mahonias (*Berberis*), Inside-out Flower (*Vancouveria*) and Heavenly-Bamboo (*Nadina*).

1a. Evergreen shrubs. Leaves pinnately divided into spiny-toothed leaflets. The fruit is moist and berry-like. . . . . ***Berberis.***
1b. Evergreen perennial herbs. Leaves biternately divided into non-spiny leaflets. The fruit is a dry follicle. . . . . ***Vancouveria.***

BERBERIS. BARBERRY, MAHONIA.

About 600 species of shrubs and subshrubs of temperate regions nearly worldwide.

Berberis pinnata Lagasca [*Mahonia p.* (Lagasca) Fedde]. CALIFORNIA BARBERRY, SHINY-LEAF MAHONIA (p. 49). *HABIT*: evergreen shrubs with more or less rounded crowns ranging from about 3 to 15 dm. (1-5') tall. *LEAVES*: alternate and pinnately divided into 5 to 9 (-17) crowded ovate to oblong and spiny-margined leaflets about 2.5 to 5 cm. long. The leaflets are dark shiny-green above and pale below. *INFLORESCENCE*: axillary and terminal racemes about 3 to 4 cm. long. *COROLLA*: six small and bifid petals. Both the petals and the larger sepals (up to 6 mm. long) are yellow. *FRUIT*: ovoid to obovoid berries about 6 to 8 mm. wide, that are dark-purplish-blue and coated with a whitish bloom. *OCCURRENCE*: rare in the Tassajara region; I have seen only two plants, both of which were growing out a crack in a cliff near the top of the second waterfall of Waterfall Creek. It is likely that the plants actually represent a single plant connected by a rhizome. *DISTRIBUTION*: scattered in the Coast, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊕March-May.

VANCOUVERIA. INSIDE-OUT FLOWER.

Three species of the Pacific Slope of temperate western North America. All three species occur in California, and two are endemic to the California Floristic Province.

⇩**Vancouveria planitpetala** Calloni [*V. parviflora* Greene]. REDWOOD IVY (p. 49). *HABIT*: rhizomatic evergreen perennial herbs with erect flowering stems ranging from about 1.5 to 5 dm. (6-20") tall. *LEAVES*: basal and with relatively long petioles, the blades divided into three major divisions, which in turn are divided into three broadly ovate-cordate, three-lobed leaflets up to 4 cm. long. *INFLORESCENCE*: the flowers generally face downward in loose terminal panicles. *COROLLA*: six white or sometimes lavender-tinged petals about 3 to 4 mm. long. Both the petals and the larger sepals are reflexed, giving the flowers an "inside-out" appearance. *FRUIT*: a two-valved follicle about 4 to 7 mm. long. *OCCURRENCE*: this entry is based on Beatrice Howitt's report of this species from along the "Church Creek Trail to Church Ranch" (Howitt Field Notes 5/15/'65; Howitt & Howell '73). It should be looked for in densely shady woodland habitats in the upper Church Creek area, particularly near streams. *DISTRIBUTION*: Coast Ranges, from southwestern Oregon to the Santa Lucia Mts. of Monterey Co., mostly in and near redwood forests. ⊛May-June.

BETULACEAE. BIRCH FAMILY.

A family comprised of six genera and about 105 species of deciduous trees and shrubs; most species are of northern temperate and boreal regions. The family includes *Betula* (birch), *Alnus* (alder) and *Corylus* (hazel), the source of hazelnuts or filberts.

ALNUS. ALDER.

About 30 species mostly of the northern hemisphere, but also represented in South America.

Alnus rhombifolia Nuttall. WHITE ALDER (p. 50). *HABIT*: broadleaf deciduous trees of riparian habitats, with generally conical or dome-like crowns ranging from about 10 to 35 m. (33-115') tall. *BARK*: thin, scaly, and grayish to brownish. *LEAVES*: alternate and on petioles about 1 to 2 cm. long, the blades about 5 to 11 cm. long, oblong-ovate to rhombic with rounded or acute apices, and with doubly serrate margins. *INFLORESCENCE*: staminate flowers are borne in dangling catkins about 3 to 8 cm. long. The catkins are quite conspicuous, for they are produced from late December to early February, months in which the trees are barren of leaves. Pistillate catkins are short and spike-like. *FRUIT*: small cone-like structures about 12 to 22 mm. long, which contain numerous small winged nutlets. *OCCURRENCE*: common to abundant along the perennial streams of the Tassajara region. *DISTRIBUTION*: British Columbia and Idaho southward, through the Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, to the mountains of San Diego Co. *NOTES*: this species is well adapted to the streamside habitats of this region, for older trees are highly resistant to the torrents that follow major storms, and although young trees are often swept away by such torrents, the loss is offset by prolific production of fertile seeds and the very rapid growth of the seedlings. Apparently due to the droughts of the mid-1990's, many alder populations along sections of normally perennial streams died out. ⊛Dec.-Feb.

BORAGINACEAE. BORAGE FAMILY.

A family comprised of about 100 genera and 2,000 species annual and perennial herbs and shrubs. The family is primarily temperate and tropical, and is well-represented around the Mediterranean Sea and in western-temperate North America. The family is especially well represented in California, and many species are endemic to the California Floristic Province. A common trait in *Boraginaceae* species are spiraled (fiddleneck-like) inflorescences, a trait that is also common in the closely related *Hydrophyllaceae* (Waterleaf Family).

1a. Perennial herbs from stout roots. Leaf blades about 8 to 15+ cm. long, generally ovate, and abruptly constricting to a relatively long and clearly defined petiole. Corollas mostly blue, fading to rose-violet with age. Nutlets armed with hooked barbs, and spreading outward in maturity. . . . . ***Cynoglossum.***

1b. Annual herbs. Leaf blades narrowly linear to lanceolate or oblanceolate, and sessile or gradually tapering to a poorly defined petiole. Corollas white, yellow or orange. Fruits not armed and not spreading outward in maturity (except in *Pectocarya*):

2a. Corollas orange to yellow. . . . . ***Amsinckia.***

2b. Corollas white:

3a. Nutlets with hooked prickles on the upper margins, and spreading widely from the base in maturity (and thus are fully exposed). Very small and inconspicuous plants. . . . . ***Pectocarya.***

3b. Nutlets without hooked prickles on the margins, and not spreading in maturity (and thus remain hidden within the calyx-lobes, except in *Plagiobothrys nothofulvus*, in which the upper portion of the calyx falls as a unit). Larger and much more conspicuous plants:

4a. Nutlets with vertical groves at the point of attachment to the ovary. Calyces armed with prickly hairs. . . . . ***Cryptantha.***

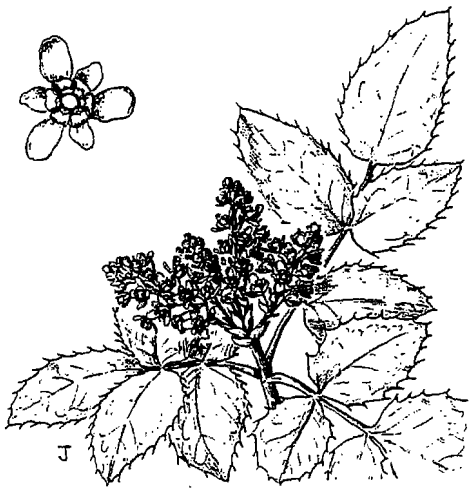
4b. Nutlets with elevated scars at the point of attachment to the ovary. Calyces with coarse but not prickly hairs. . . . . ***Plagiobothrys.***

AMSINCKIA. FIDDLENECK, FIREWEED.

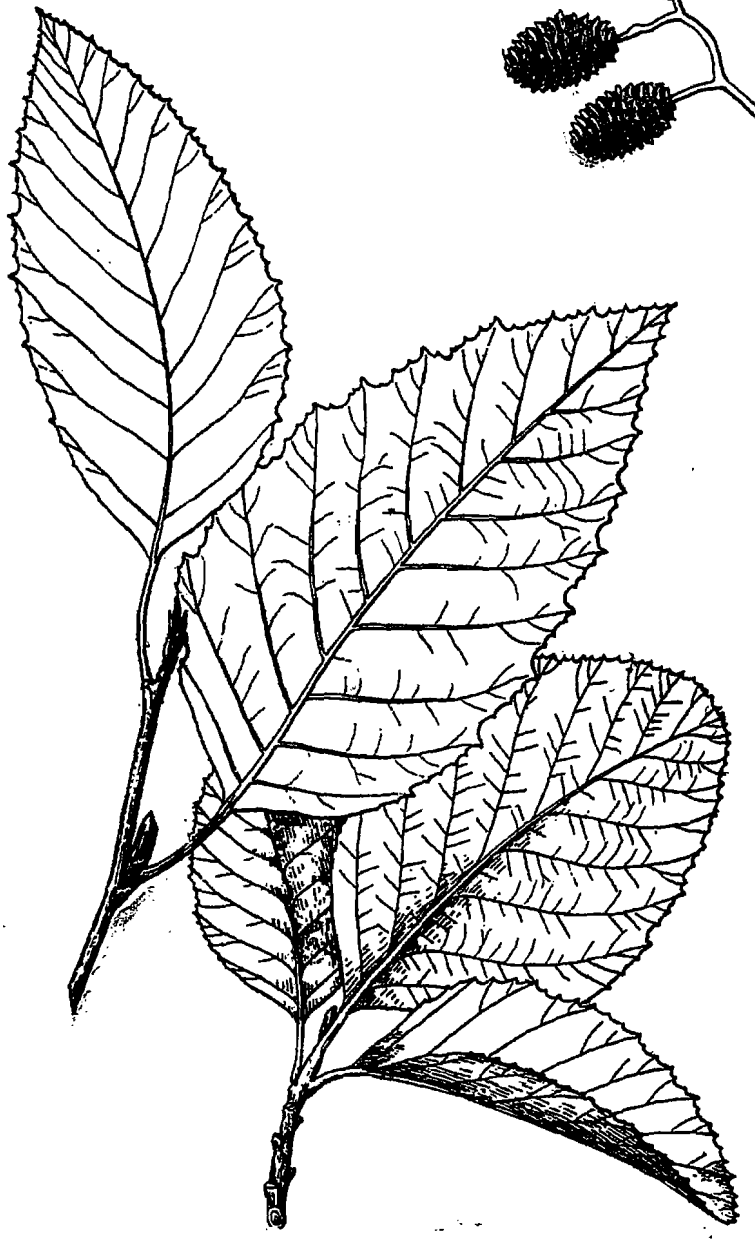
About 10 species of annual herbs of western North America and southwestern South America. Some are now weedy in other regions of the world.

1a. Corollas deep to pale orange, about 7 to 11 mm. long, the tubes well exceeding the calyx lobes. . . . . ***A. menziesii intermedia.***

1b. Corollas pale-yellow, about 4 to 7 mm. long, the tubes barely exceeding the calyx lobes. . . . . ***A. menziesii menziesii.***



Berberis pinnata



Alnus rhombifolia

Vancouveria planitpetala

Amsinckia menziesii (Lehmann) Nelson & Macbride [*A. parviflora* Heller]. HARVEST FIREWEED, RANCHER'S FIREWEED. *HABIT*: bristly annual herbs with erect and commonly branched stems ranging from about 1 to 6 dm. (4-24") tall. *LEAVES*: alternate, the lower petiolate and the upper sessile, the blades linear to lanceolate, and about 3 to 12 cm. long. *INFLORESCENCE*: the flowers are crowded in terminal spikes that are coiled toward the apex. *COROLLA*: pale yellow, funnelform, about 4 to 7 mm. long, and barely exceeding the lobes of the calyx. *FRUIT*: the ovaries mature into four roughly textured, pear-shaped nutlets about 2.5 to 3.5 mm. long. *OCCURRENCE*: locally this taxon is known to occur only in open grassland areas in the vicinity of The Caves. *DISTRIBUTION*: widely scattered in temperate western North America, from British Columbia and Utah to northern Baja California. Also in South America. ⊛April-June.

Amsinckia menziesii var. **intermedia** (Fischer & Meyer) Gandets [*A. intermedia* F. & M.]. COMMON FIDDLENECK (p. 61). *HABIT*: bristly annual herbs with erect and commonly branching stems ranging from about 2 to 9 dm. (8-36") tall. *LEAVES*: alternate, linear to lanceolate, petiolate below and sessile above, and about 3 to 15 cm. long. *INFLORESCENCE*: the flowers are produced in terminal and often sidereal spikes that are coiled at the apex. *COROLLA*: light to deep orange, funnelform, about 7 to 11 mm. long, and clearly exceeding the lobes of the calyx. *FRUIT*: the ovaries mature into four roughly textured, pear-shaped nutlets about 2 to 3 mm. long. *OCCURRENCE*: widely scattered and locally common at lower to intermediate elevations in the Tassajara region, mostly in grassy habitats. *DISTRIBUTION*: from British Columbia and Idaho to northern Baja California. ⊛April-June.

CRYPTANTHA.

A genus comprised of about 160 species of temperate western North America and southwestern South America. The genus is well represented in the California Floristic Province.

1a. Nutlets produced in 4's and roughened with pronounced bumps. . . . . ***C. muricata.***
1b. Nutlets singular (or rarely in 2's or 3's) and minutely roughened to very smooth and shiny:
2a. Nutlets textured with minute rounded bumps & pits and generally semi-glossy. . . . . ***C. decipiens.***
2b. Nutlets quite smooth and very shiny:
3a. Fruiting calyx 1.5 to 2 mm. long, and armed with straight spines about as long or longer than the calyx. . . . . ***C. microstachys.***
3b. Fruiting calyx 2 to 3.5 mm. long, and armed with mostly curving spines less than ¼ as long as the calyx. . . . . ***C. flaccida.***

Cryptantha decipiens (Jones) Heller [*C. corollata* (Johnston) Johnston, *C. rattanii* Greene, *C. c.* subsp. *r.* Abrams]. DECEPTIVE CRYPTANTHA (p. 61). *HABIT*: slender-stemmed annual herbs with erect and ordinarily branched stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: fairly remote, narrowly linear to oblong-linear, and about 1 to 6 cm. long. *INFLORESCENCE*: the flowers are small and produced in often coupled terminal spikes that coil at the apex. *COROLLA*: white, five-lobed, and about 2 to 5 mm. wide. *FRUIT*: a singular nutlet about 1.5 to 2 mm. long, with a semi-glossy surface textured with minute bumps and pits. *OCCURRENCE*: widely scattered and locally common at lower to intermediate elevations in the Tassajara region, primarily in grassy openings in chaparral and woodlands. *DISTRIBUTION*: from western Merced and Monterey Counties in the Coast Ranges to the western Transverse Ranges and Tehachapi Mts., and eastward to Utah and Arizona. *NOTE*: the local plants are referable to what Johnston ('25) recognized as *C. corollata*, with more robust plants approaching what Greene recognized as *C. rattanii*. Such plants differ from the typical species in having larger corollas (2 to 5 mm. wide instead of less than 1 mm. wide) and separate geographical distributions (*C. corollata* and *C. rattanii*-like plants occur in cismontane California, while the typical species occurs in the desert regions of southeastern California and eastward to Utah and Arizona. ⊛March-July.

Cryptantha flaccida (Lehmann) Greene. FLACCID CRYPTANTHA (p. 61). *HABIT*: erect annual herbs ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: narrowly linear to lance-linear, about 1 to 5 cm. long, with the lower-most tending to be the longest and most crowded. *INFLORESCENCE*: the flowers are produced in an open panicle comprised of coiling spike-like racemes, with the racemes produced in groups of two to five. *COROLLA*: white, five-lobed, and about 1 to 4 mm. wide. *FRUIT*: a shiny lanceolate nutlet about 1.5 to 2.5 mm. long. *OCCURRENCE*: lightly scattered in open and often rocky places in chaparral and woodlands in the Tassajara region, but common in some areas, such as along the crest of Black Butte Ridge and along the Pine Ridge and Black Cone Trails. *DISTRIBUTION*: widely distributed in western North America, from Washington and Idaho to southern California. *NOTE*: as the calyx bristles of the local plants are often straight (as opposed to curved downward and often hooked at the tip), one may be lead to *C. clevelandii*, particularly to what Johnston ('25) recognized as var. *florosa*. Based on a comparison of all characteristics, the local plants more clearly correspond to the description of *C. flaccida* than to that of *C. clevelandii*. Such characteristics include: the calyx in fruit is rarely longer than 3 mm. (instead of 3 to 6 mm.), the nutlets appear to be always singular (instead of up to 4), and the styles are much less than half the length of the nutlets (instead of about ¾ as long). ⊛April-June.

Cryptantha microstachys (Greene ex Gray) Greene. SMALL FRUITED CRYPTANTHA (p. 61). *HABIT*: slender-stemmed annual herbs ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: alternate, narrowly linear to oblong-oblanceolate, and about 1 to 4 cm. long. *INFLORESCENCE*: the flowers are relatively remote in ultimately coiling spikes which are commonly produced in two's or three's. *COROLLA*: white, five-lobed, and about .5 to 1 mm. wide. *FRUIT*: a lanceolate, dark and shiny nutlet about 1.5 mm. long. *OCCURRENCE*: widely scattered at lower to intermediate elevations in the Tassajara region, mostly in grassy openings in chaparral and woodland habitats, but often in shady situations. Plants which occur in shady habitats tend to have a more lanky habit of growth and longer and broader leaves. *DISTRIBUTION*: scattered in the Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Glenn and Kern Counties to northern Baja California. ⊛April-June.

Cryptantha muricata (Hooker & Arnott) Nelson & Macbride [*C. m.* var. *jonesii* (Gray) Johnston, *C. muriculata* (deCandolle) Greene, *C. m.* var. *vitrea* Jepson]. PRICKLY CRYPTANTHA (p. 61). *HABIT*: prickly-hairy annual herbs ranging from about 1 to 10 dm. (4-40") tall. The plants vary from rather strictly erect and upwardly few-branched to diffuse with widely spreading branches. *LEAVES*: linear, typically crowded and opposite at the base while remote and alternate above, and about 1.5 to 4 cm. long. *INFLORESCENCE*: densely floriferous coiling spikes that are often produced in parallel groups of two to five. *COROLLA*: white, five-lobed, and about 2 to 6 mm. wide. *FRUIT*: four roughly-surfaced and generally pear-shaped nutlets about 1 to 2 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and locally common in open and rocky and/or loose-soiled areas. *DISTRIBUTION*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Glenn and Nevada Counties to northern Baja California, and east to Nevada and Arizona. *NOTE*: most of the plants of this region correspond to what Johnston ('25) recognized as var. *jonesii*. ⊛April-July.

CYNOGLOSSUM. HOUND'S TONGUE.

A widely distributed genus of about 80 species.

⇩/**Cynoglossum grande** Douglas. GRAND HOUND'S TONGUE (p. 61). *HABIT*: summer-deciduous perennial herbs with erect stems ranging from about 3 to 9 dm. (1-3') tall. *LEAVES*: large and primarily basal, the blades are about 8 to 15+ cm. long, broadly ovate and abruptly narrowing to long petioles. *INFLORESCENCE*: the flowers are borne in open panicles comprised of relatively few-flowered and slightly coiling spikes. *COROLLA*: five-lobed and about 10 to 15 mm. wide, the small central appendages are white while the lobes are at first bright powder-blue, but fade to pale pinkish-lavender with age. *FRUIT*: four spreading nutlets about 5 to 6 mm. long, which are armed with short barbed prickles. *OCCURRENCE*: scattered along the Church Creek Fault (which both the Church Creek and Horse Pasture Trails follow), from the Horse Pasture to Pine Valley, usually in shady or semi-shady woodland habitats, but sometimes within dense stands of tall chaparral. *DISTRIBUTION*: Pacific Slope, from British Columbia southward, to the Santa Lucia Mts. of San Luis Obispo Co. in the Coast Ranges, and to Tulare Co. in the Sierra Nevada. ⊛March-June.

PECTOCARYA.

About 15 species of temperate western North America and South America.

1a. Plants generally prostrate. Nutlets several times longer than wide. . . . . ***P. penicillata.***
1b. Plants erect or ascending. Nutlets nearly as wide as long. . . . . ***P. pusilla.***

Pectocarya penicillata (Hooker & Arnott) deCandolle. WINGED PECTOCARYA (p. 61). *HABIT*: small annual herbs with prostrate or slightly ascending stems ranging from about 5 to 20 cm. (2-8") long. *LEAVES*: alternate, linear to slightly spatulate, and about 1 to 3 cm. long. *INFLORESCENCE*: flowers are very small and borne singularly or in small clusters which are scattered along the stems. *COROLLA*: white, five-lobed, about 2 mm. long, and only slightly exceeding the calyx lobes. *FRUIT*: four spreading oblong-oblanceolate nutlets about 1 to 3 mm. long, the margins of which are beset with hooked spines. *OCCURRENCE*: lightly scattered in open areas with sandy soils along the floodplains of Tassajara Creek, from about ½ mile above Tassajara Hot Spring to the Arroyo Seco River, but not seen elsewhere in this region. *DISTRIBUTION*: from British Columbia and Wyoming to northern Baja California. ⊛March-May.

⇩/**Pectocarya pusilla** (deCandolle) Gray. TICK-SEED PECTOCARYA, LITTLE PECTOCARYA (p. 61). *HABIT*: small annual herbs with slender and generally erect stems ranging mostly from about 5 to 30 cm. (2-12") tall. *LEAVES*: narrowly linear and less than 2 cm. long, more numerous and opposite on the lower half of the plant, the upper alternate and bract-like. *INFLORESCENCE*: flowers are very small and produced singularly and remotely along the upper stems. *COROLLA*: white, five-lobed, and less than 2 mm. wide. *FRUIT*: four spreading nutlets about 1 to 3 mm. long which are generally obovate and with small hooked spines on the margins. *OCCURRENCE*: scattered in grassy woodland habitats in the vicinity of Tassajara Hot Springs and in the Horse Pasture, and although I have not seen this species elsewhere in this region, the plants are very inconspicuous and easily overlooked. *DISTRIBUTION*: from Washington southward, to the Santa Lucia Mts. of northwestern San Luis Obispo Co. in the Coast Ranges, and to Kern Co. in the Sierra Nevada Foothills. Also native to Chile. ⊛April-June.

PLAGIOBOTHRYS. POPCORN FLOWER.

About 65 species of temperate western North America and southwestern South America. Although 39 species occur in California, and 19 are endemic to the California Floristic Province, only two are known to occur in the Tassajara region.

1a. Nutlets more or less pear-shaped (but more abruptly constricted towards the apex) and produced singularly or sometimes in two's (or rarely three's). Calyx lobes becoming infolded over the nutlets before the upper portion of the calyx disarticulates and falls off as a unit. ***P. nothofulvus.***
1b. Nutlets distinctly cross-shaped (like the Red Cross emblem) and produced in four's. Calyx lobes erect or spreading and persistent. . . . ***P. tenellus.***

Plagiobothrys nothofulvus (Gray) Gray. COMMON POPCORN FLOWER, FOOTHILL SNOWDROPS (p. 61). *HABIT*: annual herbs with one to several erect or ascending stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: the primary leaves, which are basal and produced in rosettes, are mostly oblong-oblanceolate and about 3 to 10 cm. long, while the upper leaves are much reduced, oblong to lance-oblong, and remotely scattered on the stems. *INFLORESCENCE*: elongated terminal spikes terminating in fiddleneck-like spirals. *COROLLA*: white, five-lobed, and about 3 to 9 mm. wide. *FRUIT*: one to three nutlets about 2 mm. long, the main body round-ovoid and abruptly narrowing to an acute tip. The nutlets are at first enclosed by the infolding calyx lobes, but the calyx eventually disarticulates below the lobes and falls as a unit. *OCCURRENCE*: widespread and locally common to abundant in open usually grassy habitats in the Tassajara region. *DISTRIBUTION*: from Washington to northern Baja California. ⊛March-May.

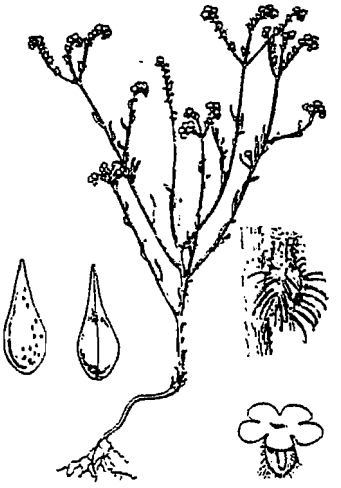
Plagiobothrys tenellus (Nuttall) Gray. DWARF POPCORN FLOWER, SLENDER POPCORN FLOWER (p. 65). *HABIT*: annual herbs with one to several slender stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: primarily basal and produced in rosettes, generally lance-oblong, and about 1.5 to 5 cm. long. Upper leaves are few, much reduced, and remotely scattered on the stems. *INFLORESCENCE*: the flowers are produced in terminal spikes that are coiled at the apex. *COROLLA*: white, five-lobed, and about 2 to 3 mm. wide. *FRUIT*: four roughly-textured and distinctively cross-shaped nutlets about 1 to 2 mm. long. *OCCURRENCE*: widespread and locally common to abundant in open and usually grassy habitats in the Tassajara region, especially in exposed areas with poor soils. *DISTRIBUTION*: widely distributed in temperate western North America, from British Columbia, Idaho and Utah to northern Baja California and Arizona. ⊛March-May.

Notes on *Boraginaceae*.

Myosotis latifolia, the blue-flowered Common Forget-Me-Not, has been found growing amongst tufts of sedges downstream from the hot springs. The plants represent escapees from the gardens at Tassajara, where the species is a common and semi-weedy ornamental. Although

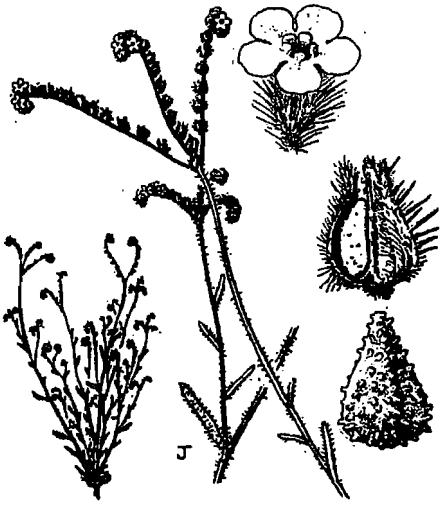
Amsinckia menziesii intermedia

Crptantha decipiens

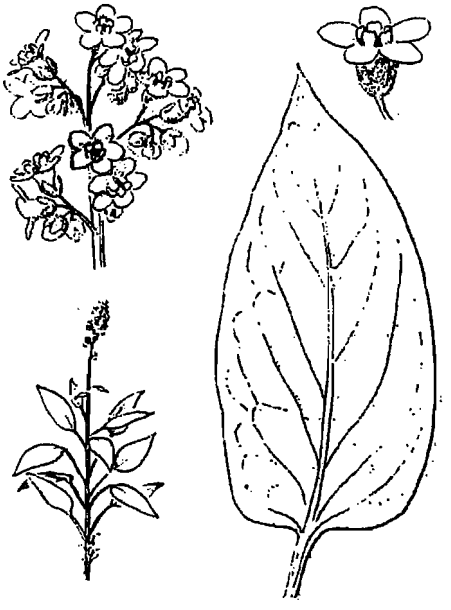


Cryptantha flaccida

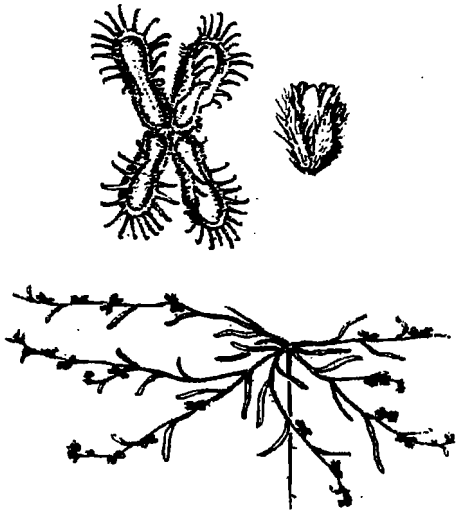
Cryptantha microstachys



Cryptantha muricata

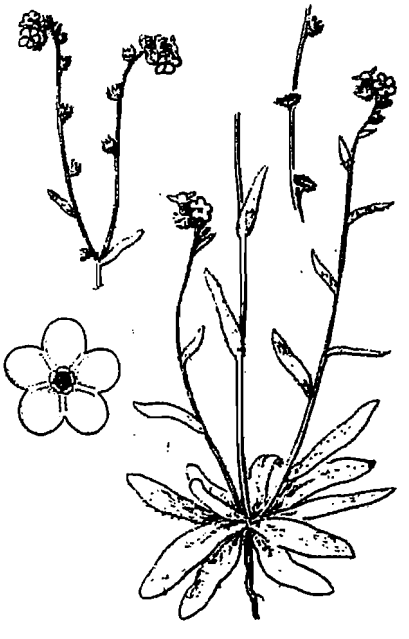


Cynoglossum grande



Pectocarya penicillata

Pectocarya pusilla



Plagiobothrys nothofulvus

this species has become naturalized in many parts of California, it is uncertain if it will become naturalized along Tassajara Creek, for the plants must be able to withstand the swift and sometimes massive torrents which follow major winter storms.

Boraginaceae species which are reported from areas of the Santa Lucia Mts. near to the Tassajara region include *Amsinckia douglasiana*, *A. vernicosa*, *Cryptantha nevadensis*, *Plagiobothrys collinus* var. *fulvescens*, *P. trachycarpus*, and *P. uncinatus*.

BRASSICACEAE (*Cruciferae*). MUSTARD FAMILY.

About 300 genera and roughly 3,000 species of annual and perennial herbs that are primarily of the temperate regions of the northern hemisphere. *Brassicaceae* includes many common vegetables (the "cole-crops"), such as bokchoy, turnips, radish, daikon, rutabagas, mustard greens (and seeds), water cress, and *Brassica oleracea*, from which at least six vegetables have been developed: broccoli, cauliflower, cabbage, kale, brussels-sprouts and kohlrabi. *Brassicaceae* also includes many weedy plants, as well as plants that have been domesticated simply for their ornamental appeal.

1a. Fruit less than three times as long as wide (silicles):
2a. Fruit one-seeded, round or roundish, fairly flat or disk-like, often with thin margins (wings), and usually facing more or less downward in maturity:
3a. Fruit bald or just slightly hairy. Margins with conspicuous spoked or perforated wings. . . . . ***Thysanocarpus***.
3b. Fruit covered with short, stiff hairs. Margins without wings. . . . . ***Athysanus***.
2b. Fruit two to many seeded, of various shapes, and if roundish, then not in all aspects like the above:
4a. Fruit elliptical, acute at both ends. . . . . ***Draba***.
4b. Fruit roundish to triangular, and notched at the apex:
5a. Fruit many seeded and triangular to heart-shaped (widest at the outer end). . . . . ***Capsella***.
5b. Fruit two seeded and ovoid to orbicular. . . . . ***Lepidium***.
1b. Fruit much more than three times as long as wide (siliques):
6a. Calyx urn-shaped, narrower at the apex, purplish-black or purplish, and often semi-glossy. Petals generally oblong-linear and several times longer than wide. . . . . ***Streptanthus***.
6b. Calyx not urn-shaped, generally wider at the apex, green (except sometimes in *Arabis brewerii*), and not glossy. Petals broadly obovate to narrowly oblanceolate, and generally not more than twice as long as wide:
7a. Petals orange. . . . . ***Erysimum***.
7b. Petals not orange:
8a. Small evergreen perennials with woody above ground roots that are found only on major cliffs and rock outcrops. Petals reddish-purple or sometimes pinkish-white. . . . . ***Arabis***.
8a. Annual or perennial herbs not like the above, and not restricted to major cliffs or rock outcrops. Petals yellow to white, or sometimes tinged pink or rose:
9a. Plants of shady or wet habitats:
10a. Petals white and sometimes tinged pink or rose. . . . . ***Cardamine***.
10b. Petals yellow. . . . . ***Barbarea***.
9b. Plants generally of open and dry habitats:
11a. Petals pale yellow to yellowish-white or sometimes pinkish. Native plants:
12a. Upper leaves sessile and clasping the stem. Siliques remaining upwardly appressed or ascending in maturity. . . . . ***Arabis***.
12b. Upper leaves petiolate. Siliques reflexed in maturity. . . . . ***Guillenia***.
11b. Petals pure yellow. Weeds:
13a. Siliques terminating with a fairly stout and conspicuous beak. . . . . ***Brassica***.
13b. Siliques beakless or with a very slender and obscure beak. . . . . ***Sisymbrium***.

ARABIS. ROCK-CRESS.

About 120 species of temperate North America, Eurasia and northern Africa. About 40 species occur in California.

1a. Plants of cliffs and major rock outcrops. Stems less than 3 dm. (12") tall. Petals reddish-purple to pinkish-white. . . . . ***A. breweri***.
1b. Plants mostly of open woodland habitats. Stems mostly well in excess of 4 dm. (16") tall. Petals yellowish-white. . . . . ***A. glabra***.

Arabis breweri Watson (p. 65). *HABIT*: small evergreen perennials with woody and often spreading above-ground roots, and erect or ascending stems ranging from about 8 to 20 cm. (3-8") tall. *LEAVES*: basal leaves are fairly crowded, petiolate with spatulate to oblanceolate blades, and about 1 to 3 cm. long. Upper leaves are reduced in size, generally lanceolate, and with sessile and clasping bases. *INFLORESCENCE*: elongating terminal racemes. *COROLLA*: four reddish-purple or sometimes pinkish-white petals about 6 to 9 mm. long. The sepals are often purple or purplish. *FRUIT*: slender and outwardly spreading siliques about 3 to 7 cm. long, containing numerous seeds about 1 mm. long. *OCCURRENCE*: frequent on cliffs and major rock outcrops in the Tassajara region. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from southwestern Oregon to Ventura Co., and to at least Sutter Co. in the Sierra Nevada. ⊛ March-July.

Arabis glabra (Linnaeus) Bernhardi [*Turritis g.* Linnaeus]. TOWER MUSTARD (p. 65). *HABIT*: biennial or short-lived perennial herbs typically with a singular and very erect stem ranging from about 4 to 15 dm. (16-60") tall. *LEAVES*: about 4 to 15 cm. long, the lower petiolate and generally oblanceolate to oblong with toothed margins, the lowermost in rosettes and tending to lay flat on the ground, the upper reduced and generally lanceolate to ovate, sessile with sagittate bases, and with entire margins. *INFLORESCENCE*: elongating terminal racemes that occupy the upper half of the plant in maturity. *COROLLA*: four yellowish-white petals about 5 to 7 mm. long. *FRUIT*: slender and upwardly appressed or ascending siliques about 4 to 10

cm. long. *Occurrence*: widely scattered in the Tassajara region, mostly in open woodland habitats, but uncommon and tending to occur singularly or in small groups. *Distribution*: widely distributed in temperate North America and Eurasia. *Note*: none of the closely observed local plants corresponded to var. *furcatipilis* Hopkins, a taxon of the Santa Lucia and Santa Cruz Mountains and Utah. ⊛ March-June.

ATHYSANUS. Dwarf Sand Weed.

One species of western North America.

Athysanus pusillus (Hooker) Greene (p. 65). *Habit*: small annual herbs ordinarily with several slender stems ranging from about 1 to 3 dm. (4-12") tall. *Leaves*: about .5 to 2 cm. long and produced in the lower portions of the plant, the lower-most, which are produced in rosettes, are petiolate and mostly broadly elliptical with remotely toothed margins, while the upper are reduced, mostly ovate to oblong, sessile, and often with entire margins. *Inflorescence*: the flowers are very small and produced in elongating terminal racemes. *Corolla*: four white petals about 1 to 2 mm. long. *Fruit*: orbicular and about 2 to 2.5 mm. wide, and generally turned downward on pedicels about 1 to 4 mm. long. The fruits are by far the most conspicuous feature of this species. *Occurrence*: widespread and locally common in open habitats at lower and intermediate elevations in the Tassajara region, and particularly abundant in sandy-soiled areas on the flood-plains of Tassajara Creek. *Distribution*: western North America, from British Columbia and Montana to northern Baja California. ⊛March-June.

BARBAREA. Winter Cress.

About 20 species of temperate regions, but chiefly of eastern Europe and southwestern Asia.

Barbarea orthoceras Ledebour. American Winter-Cress (p. 65). *Habit*: perennial or biennial herbs with erect stems ranging from about 2 to 4 dm. (8-16") tall. *Leaves*: the lower up to 10 cm. long, petiolate and generally oblanceolate to spatulate in outline, with a large and roundish to oblong terminal segment and few to many pairs of lateral leaflets or lobes (or sometimes with just a roundish terminal lobe), the upper sessile and reduced in size. *Inflorescence*: the flowers are produced in elongating terminal racemes. *Corolla*: four yellow petals about 4 to 6 mm. long. *Fruit*: slender and upwardly appressed or ascending siliques about 2.5 to 3.5 cm. long. *Occurrence*: scattered in wet or moist habitats in the Tassajara region, but uncommon. *Distribution*: widely distributed in the northern temperate regions of Eurasia and North America. ⊛ March-May.

BRASSICA. Mustard.

About 35 species of Eurasia and North Africa, and especially well represented in Mediterranean regions.

***Brassica nigra** (Linnaeus) Koch [*Sinapis n.* L.]. Black Mustard (p. 65). *Habit*: sometimes quite robust annual herbs ranging from about 3 to 25 dm. (1-8.5') tall. *Leaves*: mostly obovate to oblanceolate in outline and with a large terminal segment and one or more pairs of small lateral lobes, the margins irregularly toothed, the lower leaves about 1 to 4 dm. long and the upper gradually becoming reduced in size, the upper-most often simple, lanceolate, and sometimes entire. *Inflorescence*: the flowers are clustered at the ends of the elongating and racemose branches of an open panicle. *Corolla*: four yellow petals about 7 to 11 mm. long. *Fruit*: upwardly appressed or ascending siliques about 1 to 2 cm. long. *Occurrence*: scattered along Tassajara Road in the vicinity of China Camp and at the junction of the road to The Caves, and in the vicinity of The Caves, but not seen elsewhere in the Tassajara region. *Distribution*: a common weed in California, native of Eurasia. ⊛May-July.

CAPSELLA.

About four species of Europe.

***Capsella bursa-pastoris** (Linnaeus) Medicus. Shepherd's Purse (p. 65). *Habit*: distinctive annual herbs commonly branched at the base into several stems ranging from about 1 to 4 dm. (4-16") tall. *Leaves*: basal leaves, which are about 2 to 8 cm. long and produced in rosettes, are generally oblanceolate to spatulate in outline and with irregularly lobed margins, while the cauline leaves are reduced in size, sessile, generally lanceolate, and clasp the stem at the base. *Inflorescence*: flowers are small and produced in elongating terminal racemes. *Corolla*: four white or pinkish petals about 2 mm. long. *Fruit*: a generally heart-shaped silicle about 4 to 8 mm. long. *Occurrence*: scattered in areas of the Tassajara region that have had much exposure to human activity, such as in and around the developed area of the hot springs and at The Caves, along Tassajara Road, and occasionally along trails and at campsites. *Distribution*: a common weed nearly throughout North America, native to Eurasia. ⊛Feb.-June.

CARDAMINE. Milkmaids, Toothwort.

About 170 species of annual and perennial herbs primarily of temperate regions.

1b. Plants from vertical taproots with all leaves produced on the stems. Leaves divided into usually more than seven leaflets or lobes. . . . ***C. oligosperma.***

1a. Plants from fleshy horizontal rhizomes, with the primary leaves rising from the rhizomes independently of the flowering stems. Leaves simple or divided into usually less than five leaflets:

2a. Rhizomatic leaves three-foliate, the leaflet margins entire. Foliage thin. . . . . ***C. californica.***

2b. Rhizomatic leaves simple, the margins wavy-lobed or toothed. Foliage semi-succulent. . . . . ***C. californica sinuata.***

Cardamine californica (Torrey & Gray) Greene [*Dentaria c.* Nuttall, *D. integrifolia* Nuttall var. *c.* (Nuttall) Jepson]. Milkmaids (p. 65). *Habit*: perennial herbs from tuber-like rhizomes which annually produce erect stems ranging from about 1 to 4 dm. (4-16") tall. *Leaves*: the primary leaves, which rise from the rhizome independently of the flowering stems, are divided into three roundish to ovate leaflets about 2 to 5 cm.

wide, while the smaller cauline leaves are divided into three leaflets or lobes. *INFLORESCENCE*: the flowers are produced in terminal racemes on pedicels about 1 to 2.5 cm. long. *COROLLA*: four petals about 9 to 14 mm. long, which are white or white with a pink tinge, or sometimes with darker shades of rose, particularly on the outside. *FRUIT*: a linear and mostly ascending silique about 2 to 5 cm. long. *OCCURRENCE*: scattered in shady woodland habitats in the upper regions of Church Creek and around the Church Creek Divide. While I have not seen this taxon elsewhere in this region, it is probably more widely distributed, for it has been the most commonly collected variety in the northern Santa Lucia Mts. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊛Jan.-May.

⇩**Cardamine californica** var. **sinuata** (Greene) Detling [*C. integrifolia* Nuttall var. *s.* (Greene) Detling, *Dentaria i.* (Nuttall) Greene var. *s.*] (p. 65). *HABIT*: perennial herbs similar to the typical species, except and the blades of the rhizomatic leaves being simple and with wavy margins. The foliage is also semi-succulent. *OCCURRENCE*: locally common in shady habitats in the vicinity of Tassajara Hot Springs and along Willow Creek, and according to Griffin ('75), also on Pine Ridge. *DISTRIBUTION*: north Coast Ranges, from Oregon to Sonoma Co., and apparently in the Santa Lucia Mts. of Monterey County. *NOTE*: I have assigned such plants to this taxon based on a strict interpretation of all available keys in botanical literature. Plants fitting the description of this taxon also occur in other areas of the northern Santa Lucia Mts. of Monterey Co., as evidenced by Howitt #845 (CAS), from along the Pine Ridge Trail near Big Sur State Park, Haasis #11.59 & 15.59 (CAS), both from the Mill Creek canyon, and Cagne (CAS), from the upper Carmel River canyon 4 miles south of Los Padres Reservoir. As many of the northern Santa Lucia Mts. specimens on file at the California Academy of Sciences Herbarium and Dudley Herbarium in San Francisco lack rhizomatic leaves, it is possible that some of these also represent var. *sinuata* like plants, and one such specimen certainly represents this taxon: Bacigalupi #1119 (DS), which was collected on the "Hog Back ½ mile upstream from hotel, Tassajara Hot Springs" in 1925. ⊛Jan.-April (-May).

Cardamine oligosperma Nuttall. HILL-CRESS (p. 67). *HABIT*: annual or sometimes biennial herbs usually with several erect or ascending stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: about 2 to 9 cm. long, mostly oblanceolate in outline, and pinnately divided into 5 to 11 obovate to roundish leaflets about 3 to 20 mm. long. The larger lower-most leaves are commonly produced in rosettes. *INFLORESCENCE*: flowers are small and produced in elongating terminal racemes. *COROLLA*: four white petals about 2 to 4 mm. long. *FRUIT*: narrowly linear and upwardly ascending siliques about 15 to 25 mm. long. *OCCURRENCE*: scattered wet or seasonally wet or moist and generally shady habitats at lower to intermediate elevations in the Tassajara region, but apparently quite rare in drought years. *DISTRIBUTION*: Pacific Slope, from British Columbia to at least Madera Co. in the Sierra Nevada, and through the outer Coast Ranges, to the western Transverse Ranges of Los Angeles Co. ⊛ March-June.

DRABA.

About 350 species of northern temperate regions and the mountains of South America.

Draba verna Linnaeus [*Erophila v.* (Linnaeus) Chevall]. WHITLOW-GRASS (p. 67). *HABIT*: small winter annuals with slender flowering stems ranging from about .5 to 2.5 dm. (2-10") tall. *LEAVES*: clustered in basal rosettes, spatulate to oblanceolate with entire or toothed margins, and about 1 to 2.5 cm. long. *INFLORESCENCE*: terminal racemes. *COROLLA*: four white and two-lobed petals about 2 to 3 mm. long. *FRUIT*: generally elliptical, about 5 to 10 mm. long, and containing about 30 to 60 minute seeds. *OCCURRENCE*: widely scattered in the Tassajara region, and locally common in areas with more or less poor and sandy soils, such as in open flats on the floodplains of Tassajara Creek. *DISTRIBUTION*: widely distributed in temperate and boreal North America and Eurasia. ⊛Jan.-April.

ERYSIMUM. WALLFLOWER.

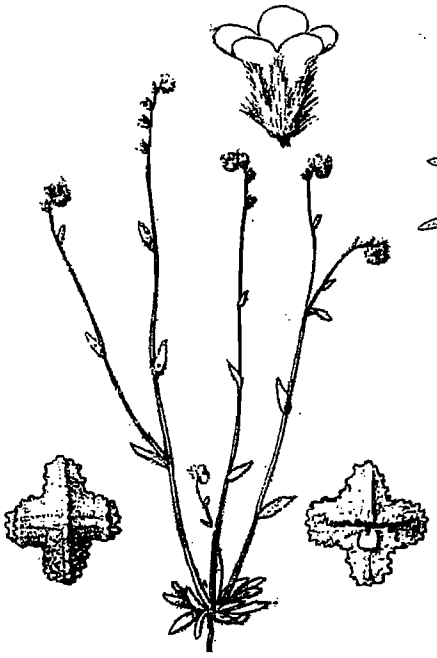
About 160 species of northern temperate regions.

Erysimum capitatum (Douglas) Greene. WESTERN WALLFLOWER (p. 67). *HABIT*: biennial or short-lived perennial herbs with erect and usually unbranched stems ranging from about 2 to 10 dm. (8-40") tall. *LEAVES*: oblanceolate to linear-lanceolate, commonly with remotely toothed margins, and ranging from about 4 to 15 cm. long. The leaves become increasing reduced in size upward on the stems. *INFLORESCENCE*: the flowers are produced in showy clusters terminating racemes which become increasingly elongated with age. *COROLLA*: four bright orange petals about 12 to 20 mm. long. *FRUIT*: a slender and four-angled silique about 5 to 10 cm. long. *OCCURRENCE*: locally common in open and often rocky places in the Tassajara region, and one of the most conspicuous and well known of the local wild-flowers. *DISTRIBUTION*: widely distributed in temperate western North America. ⊛March-July.

GUILLENIA.

Three species of western North America. Segregated from *Thelypodium*.

Guillenia lasiophylla (Hooker & Arnott) Greene [*Thelypodium lasiophyllum* (Hooker & Arnott) Greene]. CALIFORNIA MUSTARD, CUT-LEAVED THELYPODIUM (p. 67). *HABIT*: annual herbs with erect and simple or upwardly branched stems ranging from about 2 to 10 dm. (8-40") tall. *LEAVES*: alternate, petiolate, and about 3 to 12 cm. long, the lower generally oblanceolate to oblong and irregularly toothed to oblong-elliptic in outline and deeply divided into pinnate lobes (the lobes often irregularly toothed), while the upper leaves are reduced, generally linear, and entire. *INFLORESCENCE*: elongating terminal racemes. *COROLLA*: four white to yellowish or pinkish petals about 3 to 6 mm. long. *FRUIT*: slender and generally reflexed siliques about 1 to 7 cm. long. *OCCURRENCE*: very uncommon in the Tassajara region; I have seen this species only on a small serpentine outcrop along the Pine Ridge Trail about ¼ of a linear mile east of the Church Creek Divide, and Griffin ('75) reported it to be unimportant in grassland between 600 and 1200 m. (1968 to 3937') on Chew's Ridge. *DISTRIBUTION*: western North America, from British Columbia and Utah to northern Baja California. ⊛March-June.



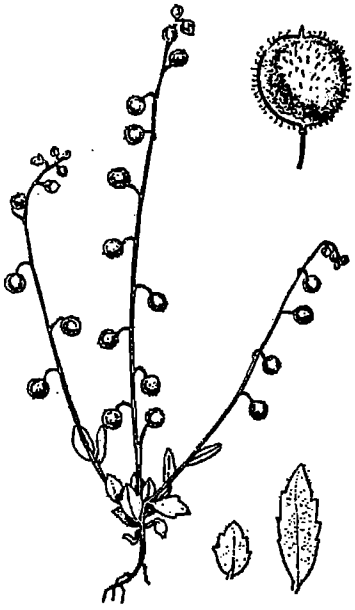
Plagiobothrys tenellus

Arabis breweri

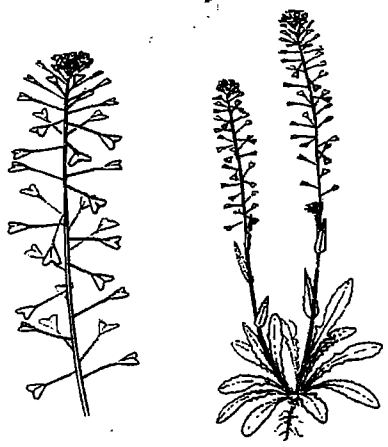
Arabis glabra

Barbarea orthoceras

Brassica nigra

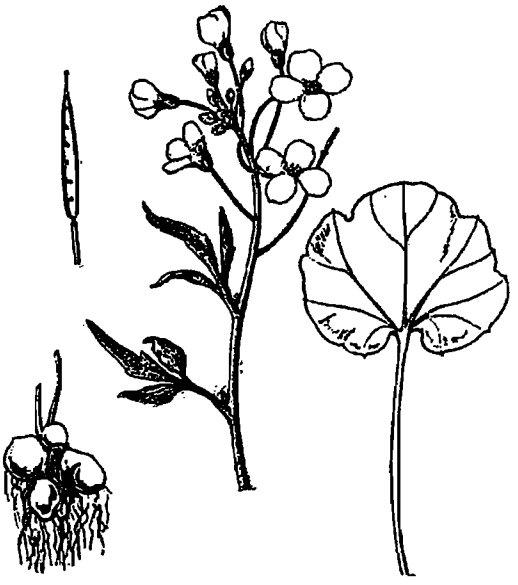


Athysanus pusillus



Capsella bursa-pastoris

Cardamine californica



Cardamine californica sinuata

LEPIDIUM. PEPPER-GRASS.

A widely distributed genus comprised of about 175 species.

Lepidium strictum (Watson) Rattan. WAYSIDE PEPPER-GRASS (p. 67). *HABIT*: annual herbs with several prostrate or nearly prostrate stems ranging from about .5 to 2 dm. (2-8") long; the stems radiate outward from the root-crown. *LEAVES*: the lower-most about 3 to 7 cm. long and pinnately or bipinnately divided into narrow and generally toothed segments, the upper becoming reduced in size and complexity. *INFLORESCENCE*: the flowers are small and borne in crowded racemes which terminate the branches. *COROLLA*: absent or of four very minute petals. *FRUIT*: an ovoid to orbicular and conspicuously notched silicle about 2.5 to 3.5 mm. long. *OCCURRENCE*: occasional on the banks and sometimes on the surface of the road to The Caves, at least in the vicinity of its junction with Tassajara Road and on The Mesa, but not seen elsewhere in the Tassajara Canyon or vicinity. *DISTRIBUTION*: western North America, from Oregon and California to Colorado, but generally uncommon, and occurring mostly in disturbed habitats. *NOTE*: although this species is native to California, the limited occurrence in man-made habitats in combination with the unusually high altitude of the known plants (from about 2,600 to 4,500'), suggests that may not be native to this region. ⊛March-May.

SISYMBRIUM.

A widely distributed genus of about 90 species. Although most species are of temperate regions, none of six species that occur in California are native.

1a. Siliques (pods) ascending or spreading and about 5 to 10 cm. long. . . . . ***S. altissimum***.
1b. Siliques upwardly appressed and about 1 to 1.5 cm. long. . . . . ***S. officinale***.

***Sisymbrium altissimum** Linnaeus. TUMBLE MUSTARD, JIM HILL MUSTARD (p. 67). *HABIT*: erect annual herbs ranging from about 5 to 10 dm. (20-40") tall. *LEAVES*: alternate and petioled, the lower about 8 to 15 cm. long, mostly oblong-elliptical in outline and pinnately or irregularly parted into generally ovate to lanceolate lobes, while the smaller upper leaves are pinnately divided into narrowly linear segments. *INFLORESCENCE*: the flowers are clustered at the ends of the elongating and racemose branches of an open panicle. *COROLLA*: four yellow petals about 6 to 8 mm. long. *FRUIT*: slender and ascending or spreading siliques about 5 to 10 cm. long. *OCCURRENCE*: weedy on the floodplains of Tassajara Creek, both above and below the hot springs, and occasionally in other areas in the Tassajara region, such as along Tassajara Road. *DISTRIBUTION*: a common weed in North America, native to Europe. ⊛April-July.

***Sisymbrium officinale** (Linnaeus) Scopoli. HEDGE MUSTARD (p. 67). *HABIT*: erect annual herbs about 2 to 10 dm. (8-40") tall. *LEAVES*: alternate, the basal long petioled, about 5 to 10 cm. long, generally oblanceolate in outline, with a broad terminal lobe and several pairs of lateral lobes, while the much reduced and sessile upper leaves are with 1 to 2 (or 3) pinnate pairs of narrow and usually retrorse lobes, and terminated with a narrowly oblong lobe. *INFLORESCENCE*: the flowers are clustered at the ends of the elongating and racemose branches of an open panicle. *COROLLA*: four yellow petals about 3 to 4 mm. long. *FRUIT*: short and upwardly appressed or ascending siliques about 8 to 15 mm. long. *OCCURRENCE*: weedy along the floodplains of Tassajara Creek, both upstream and downstream from the hot springs, and occasionally in other areas in the Tassajara region. *DISTRIBUTION*: a common weed in North America, native to Europe. ⊛April-July.

STREPTANTHUS. JEWEL FLOWER.

About 40 species of temperate to subtropical regions of western North America.

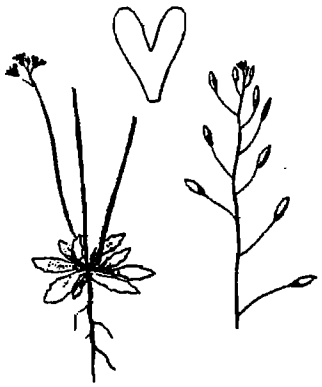
1a. Upper leaves linear to lanceolate, usually with toothed margins, and clasping the stem only at the base. . . . . ***S. glandulosus***.
1b. Upper leaves oblong-ovate to orbicular, convex with entire margins, and often so deeply clasping the stem as to appear to be attached near the middle of the blade. . . . . ***S. tortuosus***.

Streptanthus glandulosus Hooker. JEWEL FLOWER (p. 67). *HABIT*: erect annual herbs with simple or branched stems ranging from about 3 to 6 dm. (1-2') tall. *LEAVES*: alternate and about 1 to 8 cm. long, the lower-most petioled, generally oblanceolate, and with prominent callus-tipped marginal teeth, while the upper leaves are reduced, lanceolate to linear, with sessile, clasping bases, and entire or toothed margins. *INFLORESCENCE*: elongating terminal racemes. *COROLLA*: four oblong-linear and reflexing petals about 6 to 12 mm. long, that are pale to dark purple. The more showy calyx is spherical, purplish-black, and with a shiny, silky texture. *FRUIT*: narrow and ascending or spreading siliques about 5 to 9 cm. long. *OCCURRENCE*: widely scattered in the Tassajara region, but rare and restricted to serpentine outcrops or highly exposed slopes with poor or disturbed soils. I have seen this species at only four sites in this region: on a steep slope along the Horse Pasture Trail in the Horse Pasture, on a small serpentine outcrop along the Pine Ridge Trail about ¼ of a linear mile east of the Church Creek Divide, on a steep south-facing slope along the Pine Ridge Trail about ½ of a linear mile east of the Church Creek Divide, and on serpentine outcrops on Chew's Ridge. Vern Yadon reported this species to be frequent along the Black Cone Trail in July of 1980, three years after the Marble-Cone Fire. *DISTRIBUTION*: scattered in the Coast Ranges, from Lake and Sonoma Counties to San Luis Obispo Co. ⊛April-May.

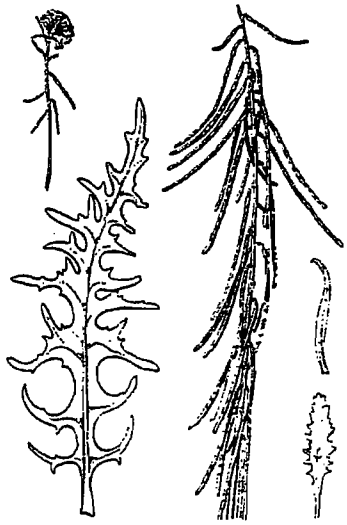
⇳**Streptanthus tortuosus** Kellogg. MOUNTAIN JEWEL FLOWER (p. 67). *HABIT*: slender-stemmed annual or biennial herbs ranging from about 1 to 10 dm. (4-40") tall. *LEAVES*: the lower petiolate, spatulate-obovate to oblong, entire or toothed, and about 3 to 8 cm. long, the upper oblong-ovate to orbicular, about 5 to 10 cm. long, convex with entire margins, and often so deeply clasping the stem that the point of attachment is near mid-leaf. *INFLORESCENCE*: elongating terminal racemes. *COROLLA*: four broadly linear and reflexed petals about 10 to 12 mm. long, that are rose-purple or yellowish-white and usually purple-veined. The sepals are purplish. *FRUIT*: a narrowly linear and typically arcing silique about 8 to 12 cm. long. *OCCURRENCE*: according to Vern Yadon ('80d), this species occurs on rock outcrops on a northerly extension of the Elephant's Back, overhanging the upper watershed of Tassajara Creek. *DISTRIBUTION*: Coast Ranges and Sierra Nevada, from Shasta Co. to Sonoma and Tulare Counties, with disjunct populations scattered at higher elevations in the Santa Lucia Mts. of Monterey Co. and northwestern San Luis Obispo Co. *NOTE*: although the Jepson Manual (Hickman, ed., '93) assigns the plants of the Santa Lucia Mts. to the subshrub variety *suffrutescens*, all of the Santa Lucia plants that I have seen (on Cone Peak) appeared to be annuals. ⊛May-Aug.

Cardamine oligosperma

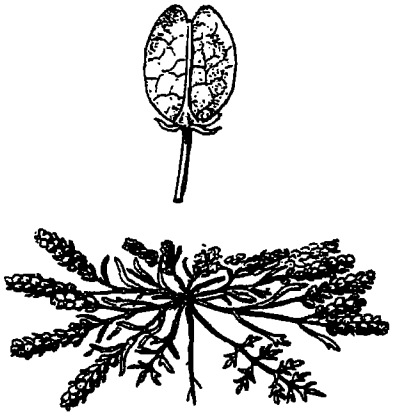
Erysimum capitatum



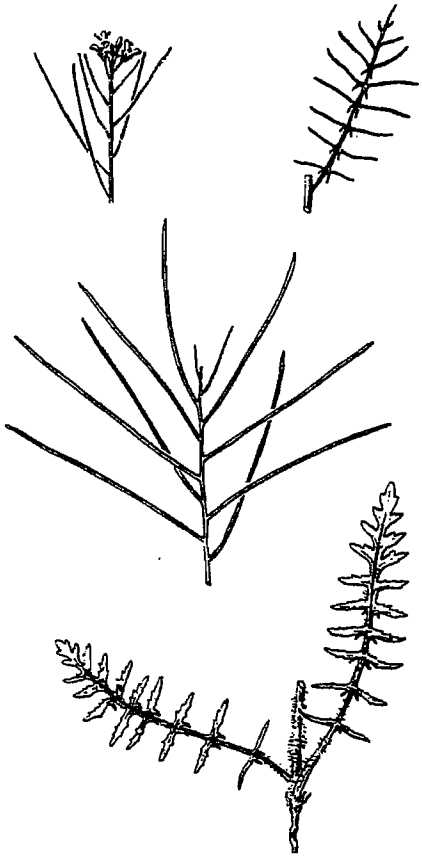
Draba verna



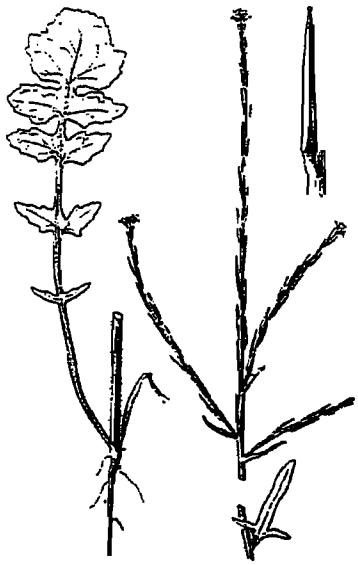
Guillenia lasiophylla



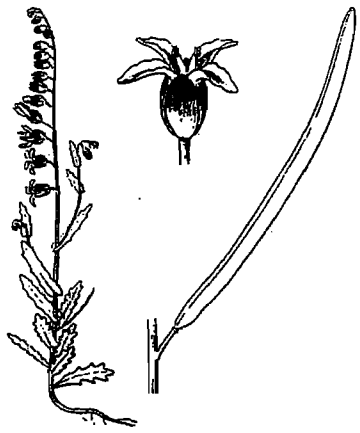
Lepidium strictum



Sisymbrium altissimum



Sisymbrium officinale



Streptanthus glandulosus

Streptanthus tortuosus

THYSANOCARPUS. LACE POD, FRINGE POD.

Five species of western North America. Four of the species occur in California, and two are endemic to the California Floristic Province.

1a. Leaves pubescent, the lower-most in rosettes, the upper clasping the stem at the base. Petals turning rose-lavender in maturity. Silicle wings usually perforated. . . . . ***T. curvipes.***

1b. Leaves glabrous, the lower-most not in rosettes, the upper not or scarcely clasping the stem at the base. Petals remaining white in maturity. Silicle wings usually with well defined "rays" or "spokes". . . . . ***T. lacinatus.***

Thysanocarpus curvipes Hooker [*T. c.* var. *elegans* (F. & M.) Robinson, *T. e.* F. & M.]. ELEGANT LACE POD, HAIRY LACE POD (p. 70). *HABIT*: erect annual herbs with slender stems ranging from about 2 to 5 dm. (8-20") tall. *LEAVES*: about 1 to 7 cm. long and with remotely toothed margins, the basal petiolate, produced in rosettes, and generally oblong-lanceolate to oblanceolate, the upper alternate, reduced, generally oblong-lanceolate to lanceolate, and with sessile and strongly clasping bases. *INFLORESCENCE*: flowers are very small and produced in elongating terminal racemes. *COROLLA*: four petals about 1 mm. long; the petals are at first white, but turn rose-lavender with age. *FRUIT*: disk-like one-seeded silicles about 5 to 7 mm. wide, with thin and usually perforated paper-like wings. The silicles, which are turned downward on pedicels about 3 to 6 mm. long, are by far the most conspicuous feature of this species. *OCCURRENCE*: widespread and locally common in open and usually grassy areas in the Tassajara region. *DISTRIBUTION*: temperate western North America, from British Columbia and Montana to northern Baja California and Arizona. *NOTE*: this is a highly variable species, and the local plants, with large silicles with perforated wings, correspond to what Robinson recognized as var. *elegans*, a taxon of cismontane California. ⊛Feb.-May.

Thysanocarpus lacinatus Nuttall [*T. l.* var. *crenatus* (Nuttall) Brewer]. NARROW-LEAVED LACE POD (p. 70). *HABIT*: slender stemmed annual herbs ranging from about 1 to 4 dm. (8-16") tall. *LEAVES*: alternate and about 1 to 4 cm. long, the lower oblong-linear and subentire or with a few narrowly linear lobes or teeth, the upper much reduced and narrowly linear. *INFLORESCENCE*: flowers are small and produced in elongating terminal racemes. *COROLLA*: four white petals about 1 mm. long. *FRUIT*: a disk-like and one-seeded silicle about 3 to 6 mm. wide, with thin and paper-like wings. *OCCURRENCE*: widely scattered and locally common in open and usually grassy habitats in the Tassajara region, mostly at lower to intermediate elevations. *DISTRIBUTION*: from the San Francisco Bay area in the Coast Ranges, and the eastern slope and southern foothills of the Sierra Nevada, to northern Baja California. *NOTE*: the local plants, with silicle wings that have well defined "rays" or "spokes," correspond to what was recognized by Brewer as var. *crenatus*, a taxon of the Coast Ranges and cismontane southern California. ⊛Feb.-May.

Notes on *Brassicaceae*.

Native *Brassicaceae* species which are reported to occur in areas of the Santa Lucia Mts. near or relatively near to the Tassajara region include: *Caulanthus coulteri* var. *lemmonii*, *Lepidium nitidum*, and *Rorippa curvisiliqua*.

Weedy about the developed area of Tassajara Hot Springs are two yellow-flowered annual herbs: *Brassica rapa* [*B. campestris*] and *Hirschfeldia incana* [*Brassica geniculata*]. *Brassica rapa*, which can be distinguish from the similar *B. nigra* by its upper leaves being entire and having strongly clasping bases, has for many years been established around the parking lot at the hot springs. It is closely related to (and a probable ancestor of) the domestic turnip. *Hirschfeldia incana* is also very similar to *Brassica*, but it can be easily distinguished from the local representatives by its coarsely-haired stems. *Raphanus sativus* (Wild Radish) was formerly weedy about the hot springs and in The Flats, but has not been seen in recent years.

CAMPANULACEAE. BELL-FLOWER or HAREBELL FAMILY.

A widely distributed family comprised of about 65 to 70 genera and roughly 2,000 species, the species ranging from annual and perennial herbs, subshrubs (some vine-like), shrubs and a few trees.

1a. Perennial herbs of wet habitats. Corollas strongly bilabiate. Filaments and anthers fused into a tube. . . . . ***Lobelia.***

1b. Annual herbs of wet or dry habitats. Corollas radially symmetrical or only slightly bilabiate. Filaments and anthers free or only the filaments fused into a tube:

2a. Corollas slightly bilabiate and white. Leaves primarily basal (upper leaves much reduced and bract-like). Filaments fused into a tube. . ***Nemacladus.***

2b. Corollas radially symmetrical and mostly blue. Leaves well developed on the stems (floral bracts are generally leaf-like). Filaments free:

3a. Leaves generally oblong to oblanceolate. Capsules dehiscent at the apex. . . . . ***Githopsis.***

3b. Leaves generally roundish. Capsules dehiscent on the side. . . . . ***Heterocodon.***

GITHOPSIS. BLUE-CUP.

Four species plus five lesser taxa of annual herbs of temperate western North America. Three of the four species (and all of the lesser taxa) are endemic to the California Floristic Province.

1a. Ovary cylindrical to obconic, narrowed near middle, the base swollen. . . . . ***G. diffusa.***

1b. Ovary obconic, top slightly narrowed, the base long tapered. . . . . ***G. specularioides.***

⇧**Githopsis diffusa** Gray (p. 70). *HABIT*: small annual herbs with simple to diffusely-branched stems ranging from about 3 to 30 cm. (1-12") long. *LEAVES*: alternate, sessile or nearly so, oblong to oblanceolate with toothed margins, and about 3 to 15 mm. long. *INFLORESCENCE*: the flowers are singular, and both terminal and lateral on the stems. *COROLLA*: about 3 to 5 mm. long, narrow-cylindrical, the tube white and the lobes deep blue. *FRUIT*: a generally club-shaped capsule about 4 to 8 mm. long. *OCCURRENCE*: this entry is based on one of A. D. E. Elmer's Tassajara Hot Springs specimens of June, 1901 (Elmer #3140, DS, MO, RSA, US), which Morin ('83)

assigned to *G. diffusa*. According to the note enclosed in an envelope attached to the DS specimen sheet, Elmer collected it "near Springs." It should be looked for on moist banks along streams and in disturbed areas, such as roadcuts and on burns. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Monterey Co. to northwestern Baja California. Also on the Channel Islands. ⊛ April-June.

Githopsis specularioides Nuttall (p. 70). *HABIT*: small annual herbs with simple or branched stems ranging from about .5 to 4 dm. (±1 to 16") tall. *LEAVES*: alternate, sessile or nearly so, about 2 to 6 mm. long, the lower ovate and withering early, the upper cuneate-obovate to narrowly oblong, and the margins are remotely toothed. *INFLORESCENCE*: the flowers are singular, and both terminal and lateral on the stems. *COROLLA*: about 4.4 to 14 mm. long, funnel-shaped with the lobes shorter than the tube, mostly deep to bright blue, and frequently exceeded in length by the narrow calyx lobes. *FRUIT*: an obconic three loculed capsule about 4 to 14 mm. long. *OCCURRENCE*: widely scattered in open and usually grassy areas in the Tassajara region, but uncommon. *DISTRIBUTION*: from Vancouver Island (British Columbia) and eastern Washington southward, to San Luis Obispo Co. in the Coast Ranges, and to Kern Co. in the Sierra Nevada. A specimen was collected in 1882 in the Santa Ana Mts. near the San Bernardino Co.-Orange Co. line, but the population appears to have become extinct (Morin '83). *NOTE*: this taxon is probably much more common in this region after fires, for it is a well-noted "burn species." ⊛March-July.

HETEROCODON.

One species of temperate western North America.

Heterocodon rariflorum Nuttall (p. 70). *HABIT*: delicate annual herbs with simple or few-branched stems ranging from about .5 to 3 dm. (2-12") long. *LEAVES*: alternate, sessile, generally roundish with dentate margins, and about 5 to 8 mm. long. *INFLORESCENCE*: the flowers are singular and axillary. The lower flowers are generally cleistogamous. *COROLLA*: about 3 to 5 mm. long, the tube white to pale blue, the lobes dark blue. *FRUIT*: a short capsule about 2.5 mm. in diameter. *OCCURRENCE*: locally common along grassy-banked brooks in Pine Valley and occasionally in similar habitats in Strawberry Valley, but not known to occur elsewhere in this region. *DISTRIBUTION*: widely scattered in western North America, from British Columbia and Montana to southern California. ⊕(April-) May-July.

LOBELIA.

A nearly worldwide genus of about 350 species of perennial herbs.

⇧**Lobelia dunnii** Greene var. **serrata** (Gray) McVaugh [*Palmerella debilis* Gray var. *s.* Gray]. CALIFORNIA LOBELIA (p. 70). *HABIT*: perennial herbs of streambed habitats with decumbent to erect stems ranging from about 3 to 5 dm. (12-20") long. The stems die back to the rhizome during the winter. *LEAVES*: alternate, the blades about 2 to 7 cm. long and with toothed margins, the lower petiolate and mostly ovate to oblanceolate, the upper sessile (or nearly so) and lanceolate to linear-lanceolate. *INFLORESCENCE*: the flowers are few to many in terminal racemes. *COROLLA*: bilabiate and about 12 to 19 mm. long, the tube white and the lips light to deep blue, the upper lip with two small and narrow lobes, the lower lip with three large, broad, and outwardly spreading lobes. *FRUIT*: an obconic capsule about 6 to 12 mm. long. *OCCURRENCE*: widely scattered along perennial streams in the Tassajara region, mostly on seepy-cliffs or rock outcrops around waterfalls and in areas where water has cut through rock formations, and sometimes forming dense stands on the banks of pools. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from the Santa Lucia Mts. of Monterey Co. to northern Baja California. *NOTE*: this species is at or very near its most northern distribution in this region, for it has not been reported to occur north of the watersheds of the Arroyo Seco and Big Sur Rivers. I suspect, however, that it also occurs in the upper watershed of the Carmel River and perhaps in the watershed of the Little Sur River. ⊛July-Sept.

NEMACLADUS. THREAD-STEM.

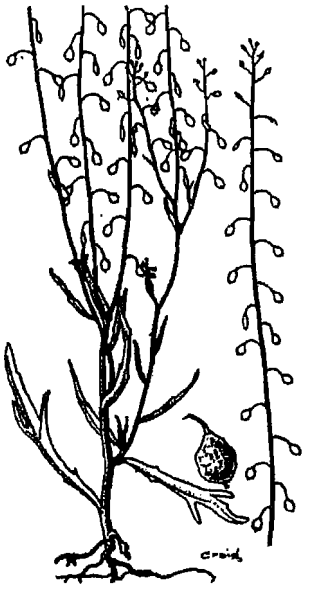
Thirteen species of the southwestern United States and adjacent areas of northern Mexico.

Nemacladus ramosissimus Nuttall (p. 70). *HABIT*: small and inconspicuous annual herbs with slender and freely branching stems ranging from about .5 to 2.5 dm. (2-10") tall. *LEAVES*: basal and produced in rosettes, generally oblanceolate with toothed margins, and about 1.3 to 4 cm. long. Upper "leaves" are small and narrow bract-like structures. *INFLORESCENCE*: the flowers are small and produced in loose racemes on capillary and spreading pedicels about 8 to 20 mm. long. *COROLLA*: white, generally bell-shaped but slightly bilabiate, and about 1.5 to 2.5 mm. long. *FRUIT*: a capsule about 1.5 to 2.5 mm. long. *OCCURRENCE*: this entry is based on two specimens collected in the vicinity of Tassajara Hot Springs in June of 1901. According to a note enclosed in an envelope pasted to the sheet of A. D. E. Elmer's "Tassajara Hot Springs" specimen (Elmer #3350 DS), the species was collected along "Hot Springs Creek, ½ mile above Springs." The exact site of collection of William Dudley's specimen (DS) is unknown, for the label simply reads "Tassajara Hot Springs, June 11, 1901." This taxon should be looked for in open and dry areas with sandy or gravely soils, especially in openings or disturbed areas in chaparral. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from the Mt. Hamilton region of Santa Clara Co. to northern Baja California. Also in Utah and New Mexico. *NOTE*: it is likely that this species is more common in this region after fires, for it has a generally ephemeral pattern of manifestation (tending to be rare to temporarily extinct in well established habitat types, but proliferating during the first few years after a fire). ⊛April-July.

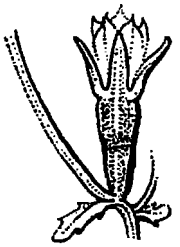
Note on *Campanulaceae*.

Campanulaceae species which have been reported to occur in areas of the Santa Lucia Mts. near or relatively near the Tassajara region (Howitt & Howell '64, Griffin '75) include: *Nemacladus capillaris*, *N. secundiflorus*, and *Triodanis biflora*.

Thysanocarpus curvipes



Thysanocarpus lacinatus

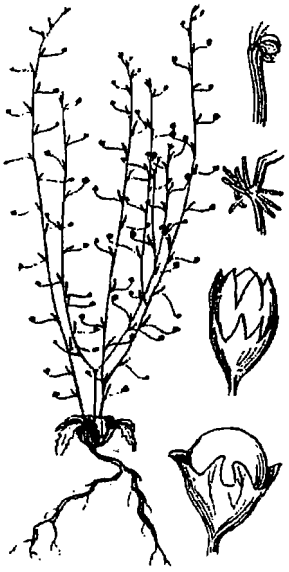


Githopsis diffusa

Lobelia dunnii serrata

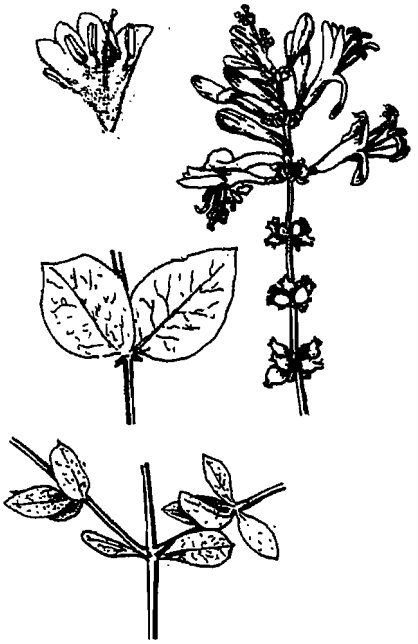
Githopsis specularioides

Heterocodon rariflorum



Nemacladus ramosissimus

Lonicera interrupta



Lonicera subspicata denudata

CAPRIFOLIACEAE. HONEYSUCKLE FAMILY.

About 12 genera and approximately 450 species of shrubs, woody vine-like climbers and (rarely) herbs. The species are primarily of temperate regions of the northern hemisphere.

1a. Relatively large shrubs to small trees. Leaves divided into 5 to 7 leaflets. Corollas rotate. . . . . ***Sambucus***.
1b. Relatively small shrubs, subshrubs, or somewhat vine-like climbers. Leaves simple. Corollas tubular-bilabiate or urn or bell-shaped:
2a. Erect or trailing shrubs or subshrubs. Corollas urn or bell-shaped and white with a rose-pink tinge. Fruits white, dry and waxy. . . . . ***Symphoricarpos***.
2b. Trailing and somewhat vine-like subshrubs. Corollas strongly bilabiate and creamy yellow to reddish-orange. Fruits red to yellowish and juicy. . . . . ***Lonicera***.

LONICERA. HONEYSUCKLE.

About 200 species of temperate and subtropical North America, Eurasia and North Africa.

1a. Upper leaves united into disk-like formations surrounding the stem. Leaves and stems nearly glabrous and not glandular. Corolla yellow to orangish-red and glabrous. . . . . ***L. interrupta***.
1b. Upper leaves not (or rarely) united. Leaves and stems mostly covered with fine hairs, the hairs of the inflorescence glandular. Corolla creamy-yellow to greenish and often hairy. . . . . ***L. subspicata***.

Lonicera interrupta Bentham. CHAPARRAL HONEYSUCKLE (p. 70). *HABIT*: semi-shrubby evergreen perennial herbs with lanky stems up to 2 m. (±6') or more in length; the stems tend to lean or become entwined on other plants. *LEAVES*: opposite, short petiolate, and about 1.5 to 3.5 cm. long, the lower orbicular to elliptical with entire margins, the uppermost fused into disk-like structures that surround the stem below the inflorescence. *INFLORESCENCE*: an often elongated terminal panicle up to 16 cm. long. *COROLLA*: bilabiate, yellow to orangish-red, and about 8 to 14 mm. long. The floral scent is very similar to that of the domestic honeysuckle. *FRUIT*: a bright red berry about 5 to 10 mm. in diameter. *OCCURRENCE*: widespread and locally common in the Tassajara region, and can be found in all habtat types except for open grassland areas. *DISTRIBUTION*: Coast Ranges and Sierra Foothills, from near the Oregon state line to the mountains of southern California. Also in Arizona. ⊛May-July.

Lonicera subspicata Hooker & Arnott var. **denudata** Rehder [*L. s.* var. *johnstonii* Keck]. MORONEL, SOUTHERN HONEYSUCKLE (p. 70). *HABIT*: semi-shrubby evergreen plants with long and slender branches ranging up to 2.4 m. (3-8') long. *LEAVES*: opposite, short-petiolate, the blades oblong to oval or ovate with mostly entire margins, and about 1 to 4 cm. long. *INFLORESCENCE*: terminal and often interrupted spike-like panicles up to 12 cm. long. *COROLLA*: bilabiate, creamy yellow to greenish, and about 8 to 14 mm. long. *FRUIT*: a red or yellow berry about 5 to 8 mm. long. *OCCURRENCE*: widely scattered but uncommon in the Tassajara region, and occurring mostly in chaparral. *DISTRIBUTION*: mostly in the mountains of southern California, but scattered northward to the Tehachapi Mts. and to Mt. Diablo in the Coast Ranges. Also reported from the Sierra Nevada in Butte Co. ⊛April-June.

SAMBUCUS. ELDERBERRY.

About 20 species of temperate and subtropical regions.

Sambucus mexicana Presl ex deCandolle [*S. caerulea* Rafinesque, *S. glauca* Nuttall, *S. orbiculata* Greene]. BLUE ELDERBERRY (p. 74). *HABIT*: deciduous shrubs or small trees with hollow branches ranging from about 2 to 8 m. (6-26') tall. *LEAVES*: opposite and short-petiolate, with the blades pinnately divided into five to seven leaflets. The leaflets are ovate to oblong-lanceolate with serrate margins, and about 3 to 20 cm. long. *INFLORESCENCE*: the flowers are small but quite numerous in large and flat-topped to convex terminal cymes. *COROLLA*: rotate, white or yellowish-white, and about 5 to 6 mm. wide. *FRUIT*: blue-black berries about 5 to 6 mm. wide. The berries appear light-bluish due to a whitish bloom. *OCCURRENCE*: widely distributed in the Tassajara region, but tending to be remotely scattered and occurring singularly or in small groups. *DISTRIBUTION*: temperate western North America, from British Columbia and Alberta to northern Baja California and northern Mexico. *NOTE*: although fully ripened fruits are edible and can be used to make pies, jam, wine, etc., green fruits (and all other parts of the plant) are poisonous. ⊛May-July.

SYMPHORICARPOS. SNOWBERRY, WAXBERRY.

About nine species of temperate North America and one of China.

1a. Plants erect and mostly about 6 to 18 dm. tall. Corolla swollen on one side and glandular within the swelling. Inflorescence mostly 8 to 16 flowered. . . . . ***S. albus***.
1b. Plants sprawling and thus usually less than 6 dm. tall. Corolla scarcely or not swollen to one side, and with five nectar-glands below each corolla lobe. Inflorescence generally 2 to 8 flowered. . . . . ***S. mollis***.

Symphoricarpos albus (Linnaeus) Blake var. **laevigatus** (Fernald) Blake [*S. rivularis* Suksdorf]. COMMON SNOWBERRY (p. 74). *HABIT*: erect deciduous subshrubs with slender stems ranging from about 6 to 18 dm. (2-6') tall. *LEAVES*: opposite and short petiolate, the blades mostly oval with entire or irregularly lobed margins, and about 2 to 3 cm. long. *INFLORESCENCE*: the flowers are produced in short racemes or clusters which are terminal and axillary. *COROLLA*: bell-shaped, white with a pink tinge, and about 4 to 6 mm. long. *FRUIT*: a roundish and white-waxy berry about 5 to 12 mm. wide. *OCCURRENCE*: widely scattered in shady woodland habitats in the Tassajara region, often near streams, and tending to form small colonies. *DISTRIBUTION*: from Alaska and Montana to the northern Sierra Nevada and outer Coast Ranges of California (to the Santa Lucia Mts. of San Luis Obispo Co.) Also reported from southern California. ⊛May-June.

Symphoricarpos mollis Nuttall. CREEPING SNOWBERRY, TRIP-VINE (p. 74). *HABIT*: deciduous subshrubs with laterally spreading stems ranging from about 3 to 9 dm. (1-3') long. *LEAVES*: opposite and short petiolate, the blades mostly roundish with entire or lobed margins, and about 1 to 4 cm. long. *INFLORESCENCE*: the flowers are pro-

duced in small terminal and axillary clusters. *COROLLA*: bell-shaped, white with a pink tinge, and about 3 to 5 mm. long. *FRUIT*: a roundish and white-waxy berry about 4 to 8 mm. wide. *OCCURRENCE*: widespread and locally common in the Tassajara region, mostly in shady woodland areas or under dense stands of tall *Ceanothus* dominated chaparral. *DISTRIBUTION*: temperate western North America, from British Columbia and Idaho to northern Baja California and New Mexico. ⊛April-June.

CARYOPHYLLACEAE. PINK FAMILY.

About 85 genera and 2,400 species of annual and perennial herbs primarily of northern temperate regions. The family includes a number of ornamental species, such as *Dianthus* (Carnations & Sweet Williams) and *Gypsophila* (Baby's-Breath).

1a. Calyx united into a tube. . . . . ***Silene.***
1b. Calyx deeply divided into distinct sepals:
2a. Capsules cylindrical. . . . . ***Cerastium.***
2b. Capsules roundish or elliptical:
3a. Petals notched or lobed at apex. . . . . ***Stellaria.***
3b. Petals entire:
4a. Annual herbs. Ovary three-valved. . . . . ***Minuartia.***
4b. Perennial herbs. Ovary six-valved. . . . . ***Moehringia.***

CERASTIUM. MOUSE-EARED CHICKWEED, POWDER HORN.

A widely distributed genus of about 60 species of annual and perennial herbs.

***Cerastium glomeratum** Thuillier [*C. viscosum* Linnaeus misapplied] (p. 74). *HABIT*: pubescent annual herbs with erect or ascending stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: opposite, the lower petiolate and the upper sessile, the blades elliptic to narrowly obovate or oblanceolate with entire margins, and about .5 to 3.5 cm. long. *INFLORESCENCE*: flowers are small and produced in terminal cymes. *COROLLA*: five white and two-cleft petals about 1.5 to 5 mm. long. *FRUIT*: a slightly curved cylindrical capsule about 4 to 8 mm. long. The minute seeds are released through an opening at the top. *OCCURRENCE*: widely scattered in the Tassajara region, and occurring mostly in open woodlands and grasslands. *DISTRIBUTION*: a common weed in North America; native to Europe. ⊛Feb.-May.

MINUARTIA. SANDWORT.

About 120 species of annual and perennial herbs of North America, North Africa and South Asia. Segregated from *Arenaria*.

Minuartia douglasii (Torrey & Gray) Mattfeld [*Arenaria d.* Fenzl ex T.& G.]. DOUGLAS SANDWORT (p. 74). *HABIT*: erect annual herbs with very slender and freely branched stems ranging from about .5 to 3 dm. (2-12") tall. *LEAVES*: opposite, sessile, very narrowly linear to filiform, and about .5 to 4 cm. long. *INFLORESCENCE*: loosely cymose terminal panicles. *COROLLA*: five white and generally obovate petals about 3 to 6 mm. long. *FRUIT*: a subglobose capsule about 2.5 to 3.5 mm. long. *OCCURRENCE*: widespread and locally common in a variety of habitats the Tassajara region, especially in places where the soil is loose or sandy. *DISTRIBUTION*: California Floristic Province, from southern Oregon to northern Baja California. Also in Arizona. ⊛ April-June.

MOEHRINGIA.

About 25 species of northern temperate regions. Segregated from *Arenaria*.

Moehringia macrophylla (Hooker) Fenzl [*Arenaria m.* Hooker]. LARGE-LEAVED SANDWORT (p. 74). *HABIT*: small rhizomatic perennial herbs with slender stems ranging from about .5 to 1.5 dm. (2-6") tall. *LEAVES*: opposite, sessile to very shortly petiolate, the blades lanceolate to oblanceolate, entire, and about 1 to 5 cm. long. *INFLORESCENCE*: two to five-flowered terminal cymes. *COROLLA*: five white and generally roundish petals about 2 to 4 mm. long. *FRUIT*: an ovoid capsule less than 3.5 mm. long. *OCCURRENCE*: according to Griffin ('75), this species is uncommon on Chew's Ridge. *DISTRIBUTION*: widely distributed in temperate North America and Asia. ⊛ April-June.

SILENE. CAMPION, CATCHFLY, INDIAN PINK.

About 500 species of annual and perennial herbs of the Northern Hemisphere.

1a. Annual herbs:
2a. Stems, leaves and calyces glabrous or subglabrous. Upper internodes sticky. . . . . ***S. antirrhina.***
2b. Stems, leaves and calyces pubescent, the hairs of the calyces glandular. Upper internodes not sticky. . . . . ***S. gallica.***
1b. Evergreen perennial herbs:
3a. Petals bright red. . . . . ***S. californica.***
3b. Petals white to yellowish or pinkish:
4a. Petals white to yellowish, the limbs reflexed and divided into 4 slender lobes. . . . . ***S. lemmonii.***
4b. Petals white to pinkish, the limbs spreading and divided into 2 broad lobes. . . . . ***S. verecunda.***

Silene antirrhina Linnaeus. SLEEPY CATCHFLY, STICKY CATCHFLY (p. 74). *HABIT*: annual herbs with erect and often branching stems ranging from about 1.5 to 8 dm. (6-32") tall. *LEAVES*: opposite and sessile, the blades linear to narrowly oblanceolate with entire margins, and about 1 to 6 cm. long. *INFLORESCENCE*: terminal and paniculate, with the flowers produced on pedicels about 1 to 4 cm. long. *COROLLA*: five white to pink and two-lobed petals about 4 to 8 mm. long. The petals barely if at all exceed the length of the calyx.

FRUIT: a generally ovoid capsule about 4 to 8 mm. long. *OCCURRENCE*: this entry is based on one of A. D. E. Elmer's Tassajara Hot Springs specimens of June, 1901 (Elmer #3147 DS), which, according to a note enclosed in an envelope pasted to the specimen sheet, was collected "Near Springs." Such plants should be looked for in open areas, especially where the soil is sandy or disturbed. *DISTRIBUTION*: widely distributed in temperate North America. *NOTE*: it is likely that this taxon is more common in this region after fires, for it is a frequently noted "burn-species." ⊛April-June (-Aug.).

Silene californica Durand. CALIFORNIA INDIAN PINK (p. 74). *HABIT*: taprooted perennial herbs with several to many erect or ascending stems ranging from about 1.5 to 4 dm. (6-16") long. *LEAVES*: opposite and nearly sessile, the blades ovate to obovate or oblanceolate, entire, and about 2 to 8 cm. long. *INFLORESCENCE*: the showy flowers are produced singularly or in few-flowered terminal cymes. *COROLLA*: five bright red petals about 2 to 3 cm. long. The outwardly spreading limbs, which are about 1 to 1.5 cm. long, are deeply divided into 4 to 6 lobes. *FRUIT*: an ovoid capsule about 2 mm. wide. *OCCURRENCE*: scattered on and around cliffs and major rock outcrops at lower elevations in the Tassajara region, such as at The Narrows and around the waterfalls of Waterfall Creek. *DISTRIBUTION*: Coast Ranges, Sierra Nevada and western Transverse Ranges, from southwestern Oregon to Los Angeles Co. *NOTE*: although this species occurs in a number of habitat types, all plants observed in this region were on rock outcrops. ⊛April-Aug.

***Silene gallica** Linnaeus. COMMON CATCHFLY, WINDMILL PINK (p. 74). *HABIT*: annual herbs with erect or ascending stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: opposite and semi-sessile, the blades mostly oblanceolate with entire margins, and about 1 to 5 cm. long (the leaves become gradually reduced upwards on the stems). *INFLORESCENCE*: generally one-sided terminal racemes. *COROLLA*: five pinkish-white and notched or entire petals. *FRUIT*: an ovoid capsule about 6 to 8 mm. long. *OCCURRENCE*: scattered in open and more or less grassy habitats in the Tassajara region, mostly along trails and in areas that have been used as forage grounds (such as in the Horse Pasture), and fairly common in suitable habitats in the immediate vicinity of Tassajara Hot Springs. *DISTRIBUTION*: a common weed in California: native to Eurasia. ⊛March-June.

Silene lemmonii Watson (p. 77). *HABIT*: taprooted perennial herbs with few to many slender stems ranging about 1.4 to 4.5 dm. (6-18") tall. *LEAVES*: opposite and petiolate or semi-sessile, the blades narrowly lance-elliptic to oblanceolate, entire, and mostly about 2 to 3 cm. long. *INFLORESCENCE*: open terminal racemes, with the flowers generally facing downward or at a downward angle. *COROLLA*: five white to yellowish (or pinkish) petals with reflexed blades about 4.5 to 8 mm. long. The blades are deeply cleft into four linear lobes. *FRUIT*: an oblong to ovoid capsule. *OCCURRENCE*: scattered in woodlands along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, in Pine Valley, and near the summit of Chew's Ridge, but not known to occur elsewhere in the Tassajara region. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southern Oregon to San Diego Co., and occurring mostly from about 3,000 to 8,000'. ⊛May-Aug.

Silene verecunda Waston subsp. **platyota** (Watson) Hitchcock & Maguire (p. 77). *HABIT*: perennial herbs with erect stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: sessile and about 1 to 9 cm. long, the basal leaves larger, generally crowded, and linear-oblanceolate to obovate, while the cauline leaves are opposite and lanceolate to linear lanceolate. *INFLORESCENCE*: the flowers are produced in cymose terminal panicles. *COROLLA*: five white to pinkish petals with outwardly spreading and deeply two-lobed blades about 4 to 6 mm. long. *FRUIT*: an oblong to ovoid capsule about 2 to 5 mm. long. *OCCURRENCE*: according to Griffin ('75), this taxon is rare on both Chew's and Pine Ridges. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Lake and Fresno Counties to northern Baja California, and occurring mostly from about 5,000 to 11,000'. ⊛June-Aug.

STELLARIA. CHICKWEED, STARWORT, STICHWORT.

A widely distributed genus comprised of about 120 species of annual and perennial herbs.

1a. Leaves crowded near base of the stem, the blades mostly linear-lanceolate. Stems glabrous or with scattered hairs. . . . . ***S. nitens***.
1b. Leaves more or less evenly spaced, the blades ovate. Stems with a line of hair on one side. . . . . ***S. media***.

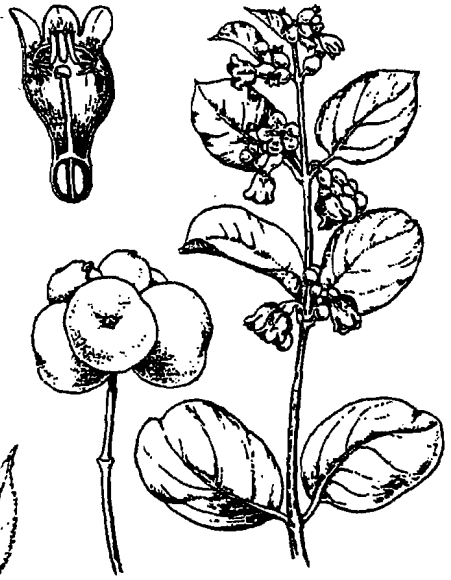
***Stellaria media** (Linnaeus) Villars. COMMON CHICKWEED (p. 77). *HABIT*: annual herbs with weak and generally procumbent stems ranging mostly from about 1 to 4 dm. (4-16") long. *LEAVES*: opposite, generally short petiolate (but the uppermost often sessile), the blades ovate, entire, and mostly about 1 to 3 cm. long. *INFLORESCENCE*: the flowers are small and produced in leafy terminal cymes. *COROLLA*: five white and deeply two-notched petals about 3.5 to 4.5 mm. long. The petals are slightly shorter than the sepals. *FRUIT*: an ovoid capsule about 4 to 5 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, particularly in and near developed areas, along trails, at campsites, etc. *DISTRIBUTION*: a common weed nearly throughout North America (and very common in California); native to Eurasia. ⊛Feb.-June.

Stellaria nitens Nuttall. SHINING CHICKWEED (p. 77). *HABIT*: erect or ascending annual herbs with simple or branched stems ranging from about .5 to 2.5 dm. (2-10") tall. *LEAVES*: opposite, about 5 to 15 mm. long, and mostly restricted to the lower half of the stems. The lower-most leaves are petiolate and with oblanceolate to obovate blades, while the upper leaves are sessile and with linear to lance-linear blades. *INFLORESCENCE*: a branching terminal panicle. *COROLLA*: five white petals less than 2 mm. long, and less than half as long as the sepals. The petals are sometimes absent. *FRUIT*: an oblong capsule about 3 to 4 mm. long. *OCCURRENCE*: scattered in semi-shady and generally grassy areas in Pine Valley. Although this species is not known to occur elsewhere in this region, it is quite possible that it is more widely distributed, for the plants are inconspicuous and easily overlooked. Griffin ('75) reported this species to be uncommon between 1,968 to 3937 ft. on Chew's Ridge. *DISTRIBUTION*: from British Columbia and Montana to northern Baja California. ⊛March-June.

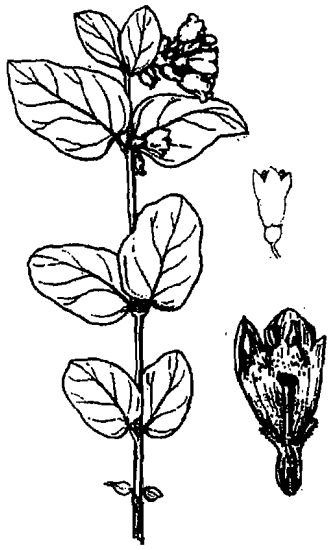
CHENOPODIACEAE. GOOSEFOOT FAMILY.

About 100 genera and 1,300 species of herbs and shrubs, with many of the species restricted to brackish marshes or salty and/or alkaline flats of desert regions. The family includes a few common vegetables, such as spinach (*Spinacia*), beets and chard (*Beta*), as well as many weedy species.

Sambucus mexicana



Symphoricarpos albus laevigatus

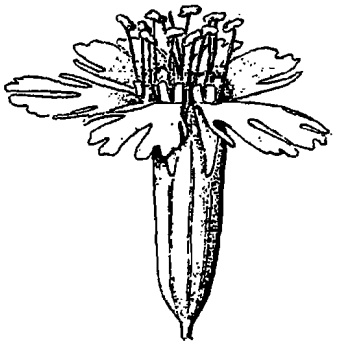


Symphoricarpos mollis

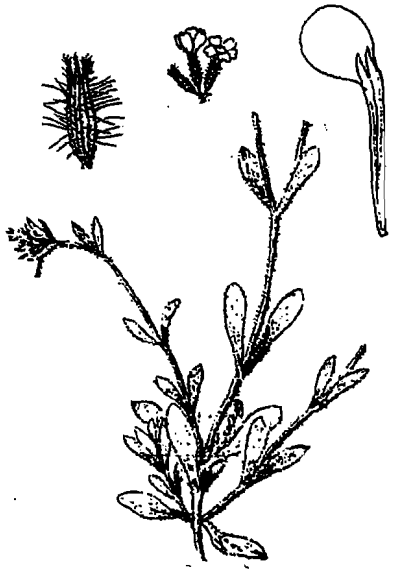
Moehringia macrophylla

Minuartia douglasii

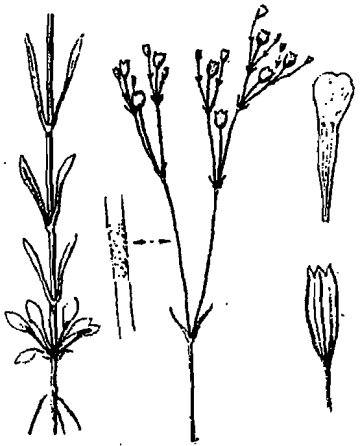
Cerastium glomeratum



Silene californica



Silene gallica



Silene antirrhina

CHENOPODIUM. GOOSEFOOT, PIGWEED.

About 150 species of annual and perennial herbs of temperate regions.

1a. Annual herbs. Leaves (of the local plants) lanceolate with entire margins or with two opposing lobes near the base. United portion of calyx shorter than lobes (while in fruit). . . . . ***C. album.***

1b. Perennial herbs from a stout and fleshy caudex. Leaves deltate with sharply toothed margins. United portion of calyx generally longer than the lobes. . . . . ***C. californicum.***

***Chenopodium album** Linnaeus var. **lanceolatum** (Muhlenberg) Cosson & Germain. LAMB'S-QUARTERS, WHITE GOOSEFOOT, COMMON PIGWEED (p. 77). *HABIT*: annual herbs with erect stems ranging from about 2 to 10 dm. (8-40") tall. *LEAVES*: alternate and on petioles about .5 to 2 cm. long, the blades lanceolate and entire or sometimes with two opposing lobes near the base, and about 1 to 5 cm. long. *INFLORESCENCE*: the flowers are produced in small glomerules scattered along elongated terminal spikes; the flowers are covered with a granular substance. *FRUIT*: an utricle (a seed with an adherent, bladder-like pericarp). *OCCURRENCE*: weedy at two sites in the vicinity of Tassajara Hot Springs (in The Flats and by the coldwater reservoir just up the road), but not seen elsewhere in this region. *DISTRIBUTION*: a highly variable taxon which is a common weed about farms and waste places in temperate regions nearly worldwide, and is probably native to Europe. While references to variety *lanceolatum* are rare in Californian literature, two Monterey County sites were listed by Howitt & Howell ('73). ⊕June-Oct.

Chenopodium californicum (Watson) Watson. CALIFORNIA GOOSEFOOT, SOAP PLANT (p. 77). *HABIT*: perennial herbs from stout and fleshy root-stocks, with decumbent or ascending stems ranging from about 2 to 9 dm. (8-36") tall. *LEAVES*: alternate and short petiolate, the blades about 2 to 10 cm. long, generally deltoid with truncate to cordate bases, and with sharply toothed margins. *INFLORESCENCE*: the flowers are small and produced in glomerules that are densely clustered on elongating terminal spikes. *FRUIT*: an utricle (a single seed with an adherent, bladder-like pericarp). *OCCURRENCE*: until a few years ago the only reference that I had to the existence of this taxon in the vicinity of Tassajara Hot Springs was Roxana Ferris' specimen, which was collected along "Tassajara Creek at Tassajara Hot Springs, alt. 1550 ft." (Ferris #8312 DS), in April of 1933. I later discovered a single plant growing in The Flats (a floodplain of Tassajara Creek southwest of the developed area of the hot springs) in the area where the road ends. As this is a plant primarily of grassland habitats, it may occur in such habitats in other areas in the Tassajara region. *DISTRIBUTION*: outer north Coast Ranges and central Sierra Nevada Foothills to northern Baja California. ⊕March-June.

CISTACEAE. ROCK-ROSE FAMILY.

Eight genera and about 165 species of primarily northern temperate perennial herbs and shrubs.

HELIANTHEMUM. ROCK-ROSE, RUSH ROSE.

About 120 species of northern temperate perennial herbs and shrubs.

Helianthemum scoparium Nuttall var. **vulgare** Jepson (p. 77). *HABIT*: profusely branched subshrubs with erect or ascending stems ranging from about 2 to 3 dm. (8-12") long. *LEAVES*: alternate, narrowly linear, and about .5 to 3 cm. long. *INFLORESCENCE*: the flowers are produced in fairly narrow panicles which terminate the branchlets. *COROLLA*: five yellow and obovate petals about 3 to 11 mm. long. The petals are shed about one day after opening. *FRUIT*: an ovoid capsule about 2.5 to 4 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, but restricted to rocky openings in chaparral, and most common on the massive sandstone outcrops along the Church Creek Fault. *DISTRIBUTION*: Coast Ranges, from Lake Co. to Santa Barbara Co., the Sierra Nevada Foothills, from El Dorado Co. to Mariposa Co., along the coast of southern California and northern Baja California, and on the Channel Islands. *NOTE*: the distinctive sepals provide an easy and sure way to identify this species: one sepal is clearly the largest, two are of equal and intermediate size, and the remaining two are tiny appendages. ⊕March-June.

CONVOLVULACEAE. MORNING GLORY FAMILY.

About 50 genera and 1,000 species of trees, shrubs and herbs, many of which are climbing vines. Well known plants include the various Morning Glories (*Calystegia*, *Convolvulus*, and *Ipomoea*), Sweet Potatoes (*Ipomoea batatas*), and the lawn-like ground-cover *Dichondra*.

CALYSTEGIA. MORNING GLORY.

About 150 species of vines or vine-like perennial herbs or subshrubs of temperate regions.

1a. Prostrate but non-climbing plants with branches mostly less than 6 dm. (2') long. Leaves and stems densely woolly. Calyx closely subtended by two sepal-like bracts. . . . . ***C. malacophylla.***

1b. Sprawling and climbing vines with branches up to 6 m. (20') long. Leaves and stems mostly glabrous. Calyx remotely subtended by two bracts that are not sepal-like. . . . . ***C. purpurata.***

Calystegia malacophylla (Greene) Munz subsp. **pedicellata** (Jepson) Munz [*Convolvulus malacophyllus* Greene subsp. *pedicellatus* (Jepson) Abrams, *Con. villosus* var. *pedicellatus* Jepson]. WOOLLY MORNING GLORY (p. 77). *HABIT*: rhizomatic, generally tufted, and densely white-woolly perennial herbs with prostrate stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: alternate and with petioles about .5 to 3 cm. long, the blades deltoid-hastate and about 2 to 4 cm. long. *INFLORESCENCE*: the showy flowers are axillary and produced on pedicels about 6 to 9 cm. long. *COROLLA*: broadly funnel-shaped, creamy-white, and about 2.5 to 3.5 cm. long. *FRUIT*: a roundish capsule about 2 to 3 mm. long. *OCCURRENCE*: widely scattered and locally common at higher to intermediate elevations in the Tassajara region (rarely below about 2,500'), and occurring mostly in openings in chaparral on south-

facing slopes. *DISTRIBUTION*: mostly between 1,500 and 6,000' in the Coast Ranges and western Transverse Ranges, from Alameda Co. to northern Ventura Co. (in the vicinity of Mt. Pinos). ⊛April-July.

Calystegia purpurata (Greene) Brummitt [*C. p.* subsp. *solanensis* (Jepson) Brummitt, *Convolvulus occidentalis* Gray subsp. *solanensis* (Jepson) J.T. Howell, *Con. luteolus* var. *s.* Jepson]. CHAPARRAL MORNING-GLORY (p. 77). *HABIT*: perennial vines from a woody caudex, with long and climbing stems ranging up to 6 m. (20') in length. The stems wither away at the end of the growing season (late summer to fall). *LEAVES*: alternate and petiolate, the blades triangular-hastate, generally entire (but often somewhat irregular on the hastate extremities), and about 1 to 5 cm. long. *INFLORESCENCE*: the showy flowers are produced in the axils of the leaves on pedicels about 2 to 6 cm. long. *COROLLA*: broadly funnel-shaped, creamy-white with five dull purplish-red stripes radiating from the center, and about 3 to 4 cm. long. *FRUIT*: a roundish capsule. *OCCURRENCE*: widely scattered and moderately common in chaparral at lower to intermediate elevations in the Tassajara region, but apparently absent on the higher ridges. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Humboldt Co. to Ventura Co. Also reported from the Sutter Buttes. ⊛April-July.

CORNACEAE. DOGWOOD FAMILY.

A primarily northern temperate family comprised of about 12 genera and 100 species of trees, shrubs and perennial herbs.

CORNUS. DOGWOOD.

A primarily northern temperate genus comprised of about 50 species of trees, shrubs and perennial herbs.

Cornus sericea Linnaeus subsp. **occidentalis** (Torrey & Gray) Fosberg. [*C. o.* (Torrey & Gray) Coville]. WESTERN DOGWOOD, CREEK DOGWOOD (p. 80). *HABIT*: deciduous shrubs ranging from about 1.5 to 4 m. (5-13') tall. *LEAVES*: opposite and petiolate, the blades ovate to lanceolate or elliptic, entire, and about 5 to 10 cm. long. *INFLORESCENCE*: the flowers are produced in terminal and more or less cluster-like cymes. *COROLLA*: four white and generally lanceolate petals about 3 to 4.5 mm. long. *FRUIT*: white to cream-colored drupes about 7 to 9 mm. in diameter. *OCCURRENCE*: rare in shady areas along streams in Pine Valley, and, according to Griffin ('75), rare in similar habitats on Chew's Ridge. Although this species is not known to occur elsewhere in this region, it may be present in suitable habitats in other areas, such as in the upper regions of Tassajara Creek, Church Creek, and Miller's Canyon. *DISTRIBUTION*: western North America, from Alaska and Montana to southern California. ⊛May-July.

CRASSULACEAE. STONE-CROP FAMILY.

A Family comprised of about 30 genera and 1,500 species of annual and perennial herbs or subshrubs; most of the perennial species are succulent. The family is especially well represented in southern Africa, but is also well represented throughout most of the Eastern Hemisphere and in North America (but nearly to entirely absent in Australia, New Zealand and South America). Many species are utilized in ornamental horticulture.

1a. Minute winter annuals of open areas with poor and/or compacted soils. Leaves only a few mm. long and opposite on erect stems. . . . ***Crassula.***

1b. Succulent evergreen perennial herbs of cliffs, rock-outcrops, or rocky slopes. Leaves are much larger and produced in basal rosettes:

2a. Plants unbranched and not forming mats. Leaves generally acuminate at the apex. . . . . ***Dudleya.***

2b. Plants branching and tending to form mats. Leaves generally rounded at the apex. . . . . ***Sedum.***

CRASSULA.

About 300 species of annual & perennial herbs and subshrubs primarily of southern Africa.

Crassula connata (Lopez & Pavon) Berger [*Tillaea erecta* Hooker & Arnott]. SAND PYGMY (p. 80). *HABIT*: very small annual herbs with erect stems generally less than 6 cm. (2½") tall. The entire plant becomes colorful in maturity, adding red, orange, and yellow to the basic green. *LEAVES*: opposite and sessile, the blades are ovate to oblong, less than 3 mm. long, and often fused at the base. *INFLORESCENCE*: the flowers are minute and produced in terminal and axillary clusters. *COROLLA*: three to five petals less than 1 mm. long, which are generally shorter than the sepals. *FRUIT*: a follicle that splits into three to five one or two seeded carpels. *OCCURRENCE*: widely scattered in the Tassajara region, but mostly restricted to exposed places with poor or sandy soils. From late winter to early spring dense stands growing in the compacted soils of trail beds are often encountered. *DISTRIBUTION*: from Oregon and Texas to northern Central America. Also native to Chile. ⊛Feb.-May.

DUDLEYA. LIVE FOREVER, ROCK LETTUCE, HEN AND CHICKS.

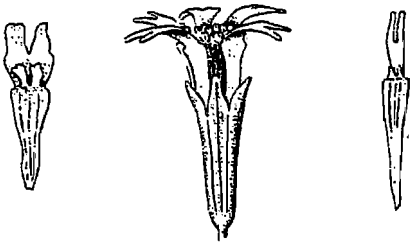
About 45 species of southwestern temperate North America.

1a. Rosette leaves up to 12 (-17) cm. long. Flowering stems 1.5 to 3.2 (-4.5) dm. tall. . . . . ***D. cymosa.***

1b. Rosette leaves usually less than 5 cm. long. Flowering stems usually less than 1.5 dm. tall. . . . . ***D. cymosa pumila.***

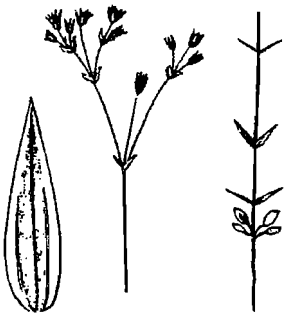
⇩?**Dudleya cymosa** (Lemaire) Britton & Rose [*Cotyledon laxa* (Lindley) Brewer & Watson var. *cymosa* Jepson]. CANYON DUDLEYA (p. 80). *HABIT*: perennial herbs from a short caudex, with the bulk of the plant consisting of a basal rosette of very succulent leaves. The flowering stems, which are erect from decumbent bases, arise from the axils of the lower leaves, and range from about 1.5 to 3.2+ dm. (6-12+") tall. *LEAVES*: about 2 to 12+ cm. long and mostly acuminate at the apex, the lower (outer) leaves oblanceolate to spatulate while the smaller upper (central) leaves are mostly broadly lanceolate. The leaves of the flowering stems are much reduced, alternate, and ovate to triangular-lanceolate. *INFLORESCENCE*: terminal and paniculate, with the flowers produced mostly on the upper side of branches that are often slightly

Silene lemmonii

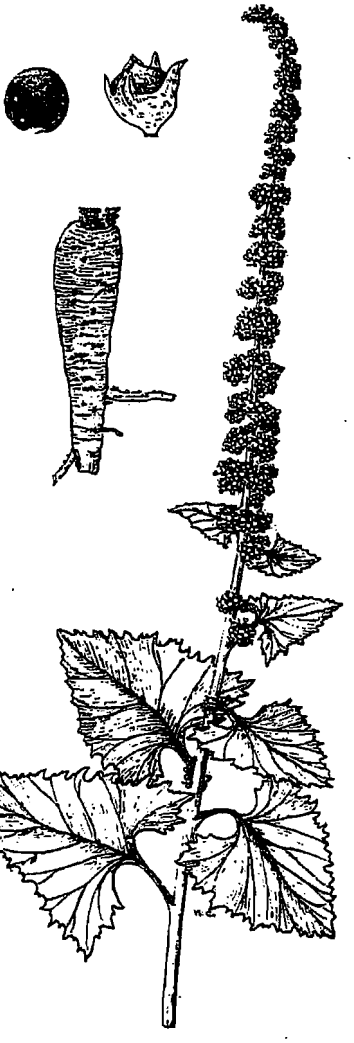


Silene verecunda

Stellaria media

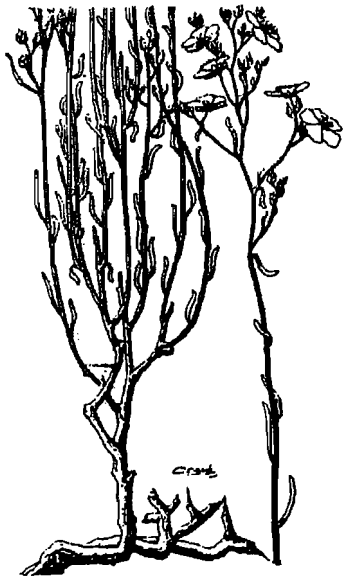


Stellaria nitens

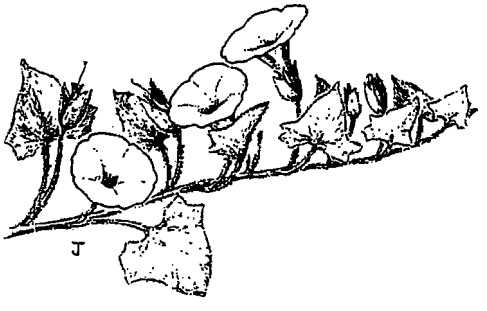


Chenopodium californicum

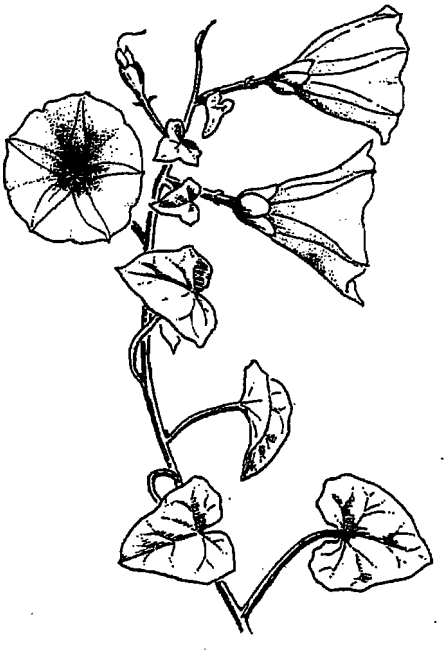
Chenopodium album



Helianthemum scoparium



Calystegia malacophylla



Calystegia purpurata

coiled towards the apex when young. *COROLLA*: five lanceolate to elliptic petals about 10 to 12 mm. long; the petals range from yellow to orange or red. *FRUIT*: five many-seeded follicles. *OCCURRENCE*: widely scattered in rocky and shady or semi-shady habitats in the Tassajara region, but uncommon. *DISTRIBUTION*: Coast Ranges, from southwestern Oregon to the Santa Lucia Mts. of Monterey Co., and the Sierra Nevada, from Butte Co. to Kern Co. *NOTE*: this taxon is apparently rare in the Santa Lucia Mts. of Monterey Co., for the only other reports that I am aware of are from the Landels-Hill Big Creek Reserve (Genetti & Engles #427 CAS), the Arroyo Seco area and from along Cachauga Rd. (Matthews '97). ⊛April-July.

⇧?**Dudleya cymosa** subsp. **pumila** (Rose) Nakai [*D. c.* subsp. *minor* (Rose) Moran in part]. DWARF CANYON DUDLEYA. *HABIT*: succulent evergreen perennial herbs similar to the typical species, except for the smaller size (i.e., the leaves are usually less than 5 cm. long, and flowering stems are usually less than 1.5 dm. tall). *OCCURRENCE*: widely scattered on cliffs, rock outcrops and rocky slopes in the Tassajara region, and occurring mostly in areas with full sunlight. *DISTRIBUTION*: outer South Coast Ranges and Transverse Ranges, below 6,000 ft., from the Santa Lucia Mts. of Monterey Co. to the San Bernardino Mts. of San Bernardino Co. ⊛April-July.

SEDUM. STONECROP.

About 500 species of succulent perennial herbs of rocky habitats. The species occur in northern temperate regions and in mountainous areas of tropical regions.

Sedum spathulifolium Hooker [*S. s.* subsp. *anomalum* (Britton) Clausen in part]. PACIFIC STONECROP (p. 80). *HABIT*: evergreen perennial herbs with laterally spreading branches which can form dense mats on rock outcrops. *LEAVES*: the rosette leaves are mostly spatulate and about .5 to 3 cm. long, while the cauline leaves are alternate, elliptic-oblong to spatulate, and about .5 to 2 cm. long. *INFLORESCENCE*: the flowers are produced in simple or compound cymes or panicles terminating lateral (and ascending to erect) branches about .5 to 3 dm. (2-12") long. *COROLLA*: five yellow and generally lanceolate petals about 5 to 8 mm. long. *FRUIT*: four or five follicles about 4 to 8 mm. long. *OCCURRENCE*: scattered on cliffs and major rock outcrops in the Tassajara region, mostly in shady or semi-shady situations, and often forming dense masses in some places, such as around Tassajara Falls and at The Narrows. *DISTRIBUTION*: from northern British Columbia southward, through the Cascades, Coast Ranges and Sierra Nevada, to the Transverse Ranges of southern California. ⊛May-July.

CUCURBITACEAE. CUCUMBER OR GOURD FAMILY.

About 100 genera and 700 species of annual and perennial herbs that are primarily of tropical and subtropical regions. Although many of the species have edible fruits, such as pumpkins and the various winter squashes (*Cucurbita*), watermelon (*Citrullus*), cantaloupe, honeydew melon, and cucumbers (*Cucumis*), and the Mexican chayote (*Sechium*), many are poisonous, including the fruits of the sole representative of this family in the Tassajara region.

MARAH. MANROOT, WILD CUCUMBER.

About seven species of western North America.

Marah fabaceus (Naudin) Greene [*Echinocystis fabacea* Naudin]. CALIFORNIA MANROOT, MAN IN THE GROUND, CALIFORNIA CUCUMBER (p. 80). *HABIT*: perennial vines from massive tubers resembling a man both in appearance and in size. The annually-produced branches, which usually wither away by early summer, can reach over 7 m. (23') long by the end of the rainy season. *LEAVES*: alternate and with petioles about 3 to 6 cm. long, the blades about 5 to 10 cm. wide, generally roundish in outline, and five to seven-lobed. *INFLORESCENCE*: the small flowers are produced in the axils of the leaves, the pistillate solitary and the staminate in racemes. *COROLLA*: pale-white to yellowish, rotate and deeply-five lobed, and about 7 to 10 mm. wide. *FRUIT*: a large, roundish, berry-like structure about 4 to 5 cm. long, with a green rind covered with non-prickly spines, and a moist and spongy interior containing four stone-like seeds. *OCCURRENCE*: widespread and locally common in woodland and chaparral habitats in the Tassajara region. *DISTRIBUTION*: the typical form, such as the plants in this region, occurs in the Coast Ranges from Marin Co. to Monterey Co., while var. *agrestis*-like plants are more widely distributed in the Coast Ranges, Sierra Nevada, and western Transverse Ranges. *NOTE*: native Californians are reported to have used the ground seeds of this species to stupefy fish and as a means of euthanasia for the aged. ⊛Feb.-April.

CUSCUTACEAE. DODDER FAMILY.

A family comprised of only one genus.

CUSCUTA. DODDER.

A widely distributed genus comprised of about 150 species of annual parasitic vines. The genus is particularly well represented in the tropical regions of the Americas.

Cuscuta californica Hooker & Arnott. CALIFORNIA DODDER (p. 80). *HABIT*: orangish-yellow parasitic vines with many slender and leafless stems which more or less closely entwine the host plant. *INFLORESCENCE*: the flowers are small and produced in cymose clusters. *COROLLA*: about 2.5 to 5 mm. long, cylindric-campanulate and five-lobed, and the same color as the rest of the plant. *FRUIT*: a globose and one to four-seeded capsule about 1.5 to 2 mm. long. *OCCURRENCE*: widely scattered and locally common on a variety of host species in the Tassajara region, with populations varying considerably from season to season. *DISTRIBUTION*: Pacific Slope, from Washington to northern Baja California. ⊛May-Aug.

DATISCACEAE. DATISCA FAMILY.

A small family comprised of only three genera and four species of perennial herbs and trees.

DATISCA.

Two species of perennial herbs. One species is scattered from Crete to India, while the other is endemic to the California Floristic Province.

Datisca glomerata (Presl) Baillon. DURANGO ROOT (p. 80). *HABIT*: perennial herbs with erect and branching stems ranging from about 7 to 18 dm. (28-72") tall. The stems die back to the root during the winter. *LEAVES*: mostly alternate (but sub-opposite or whorled lower on the stems), the petioles are about 1 to 4 cm. long, while the blades are ovate to lanceolate in outline and about 10 to 20 cm. long, with the larger leaves pinnately incised into lanceolate segments. *INFLORESCENCE*: the flowers are produced in small clusters that are axillary in the upper leaves. Staminate flowers are about 2 mm. long and with four to nine lobed calyces, while pistillate flowers are about 5 to 8 mm. long and with three-toothed calyces. *COROLLA*: none. *FRUIT*: an ovoid capsule about 8 mm. long. The numerous seeds are about 1 mm. long. *OCCURRENCE*: widely scattered and locally common in the streambeds of both perennial and intermittent streams of the Tassajara region. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Siskiyou Co. to northern Baja California. ⊕May-July.

ERICACEAE. HEATH FAMILY.

About 100 genera and 3,000 species primarily of northern-temperate regions; the species range from perennial herbs to trees. Well known genera include *Rhododendron* (azalea), *Vaccinium* (blueberries, cranberries and huckleberries) and *Erica* (the heathers). The subfamilies *Monotropoidea*, *Pyroloideae* and *Vaccinioidea* are often treated as separate families.

1a. Small perennial herbs. Corolla divided into five distinct petals. . . . . ***Chimaphilla***.
1b. Trees and shrubs. Corolla urn-shaped:
2a. Evergreen trees ranging from about 5 to 30 m. (16-100') tall. Leaves about 5 to 12 cm. long. Fruits moist, fleshy, and red to reddish-orange. . . . . ***Arbutus***.
2b. Evergreen shrubs ranging from about .3 to 6 m. (1-20') tall. Leaves about 1 to 5 cm. long. Fruits firm and green. . . . ***Arctostaphylos***.

ARBUTUS. MADRONE, STRAWBERRY TREE.

About 20 species of northern-temperate trees and shrubs.

Arbutus menziesii Pursh. PACIFIC MADRONE, MADRONO, MADRONA (p. 81). *HABIT*: broadleaf evergreen trees ranging from less than 6 m. (20') in unfavorable habitats to over 30 m. (100') tall in densely forested areas. Unusually large trees can have trunks up to 10' in diameter. *BARK*: generally very smooth and brownish-red (and thus similar to the bark of manzanitas), although the trunks and primary branches of older trees tend to develop a dark and flaky bark. *LEAVES*: alternate and with petioles about 1 to 2.5 cm. long, the blades elliptic to subovate, dark glossy green above and paler beneath, and about 5 to 12 cm. long. *INFLORESCENCE*: the flowers are produced in large and showy paniculate clusters. *COROLLA*: urn-shaped, white with a pink tinge, and about 6 to 8 mm. long. *FRUIT*: red to orangish-red berries about 8 to 10 mm. wide, which contain small stone-like seeds about 2.5 mm. long. The berries ripen from late autumn to early winter. *OCCURRENCE*: widely scattered and locally common to abundant in the woodlands of the Tassajara region, but mostly at intermediate to higher elevations. *DISTRIBUTION*: Pacific Slope, from British Columbia to the higher mountains of southern California. In California the species occurs mostly in the north Coast Ranges, but major populations occur southward in the Coast Ranges in the Oakland-Berkeley Hills, in the Santa Cruz Mts., and in the Santa Lucia Mts. In the Sierra Nevada the species is scattered between Butte and Tuolumne Counties, and in southern California populations are scattered in the western Transverse Ranges of Santa Barbara Co. and western Ventura Co. (and on Santa Cruz Island, Santa Barbara Co.), in the San Gabriel Mts. of Los Angeles Co., in the Santa Ana Mts. of eastern Orange Co. and western-most Riverside Co., and in the Mt. Palomar region of northern San Diego Co. ⊕March-May.

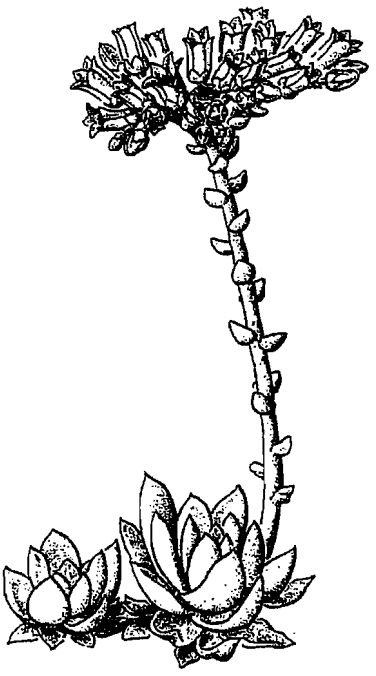
ARCTOSTAPHYLOS. MANZANITA, BEAR BERRY.

About 60 species of temperate western North America, with one species (*A. uva-ursi*) widely distributed in temperate and boreal regions of North America and Eurasia. Nearly all of the species occur within California, and most are endemic to the California Floristic Province. The Spanish word manzanita means little apple.

1a. Plants burl-forming and ranging from about .3 to 2.5 m. (1-8') tall. Leaves and stems usually hairy and often sticky. Corollas seldom tinged with pink. Fruits with weakly consolidated stones that can easily be broken apart. . . . . ***A. glandulosa***.
1b. Plants without burls and ranging from about 2 to 8 m. (6.5-26') tall. Leaves and stems glabrous and glaucous. Corollas pinkish-tinged. Fruits with strongly fused stones. . . . . ***A. glauca***.

Cornus sericea

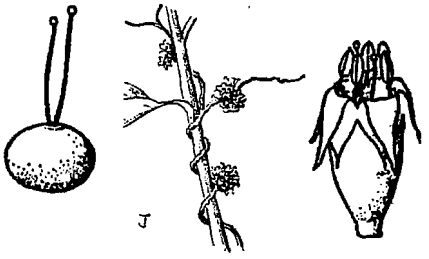
Crassula connata



Dudleya cymosa

Sedum spathulifolium

Marah fabaceus

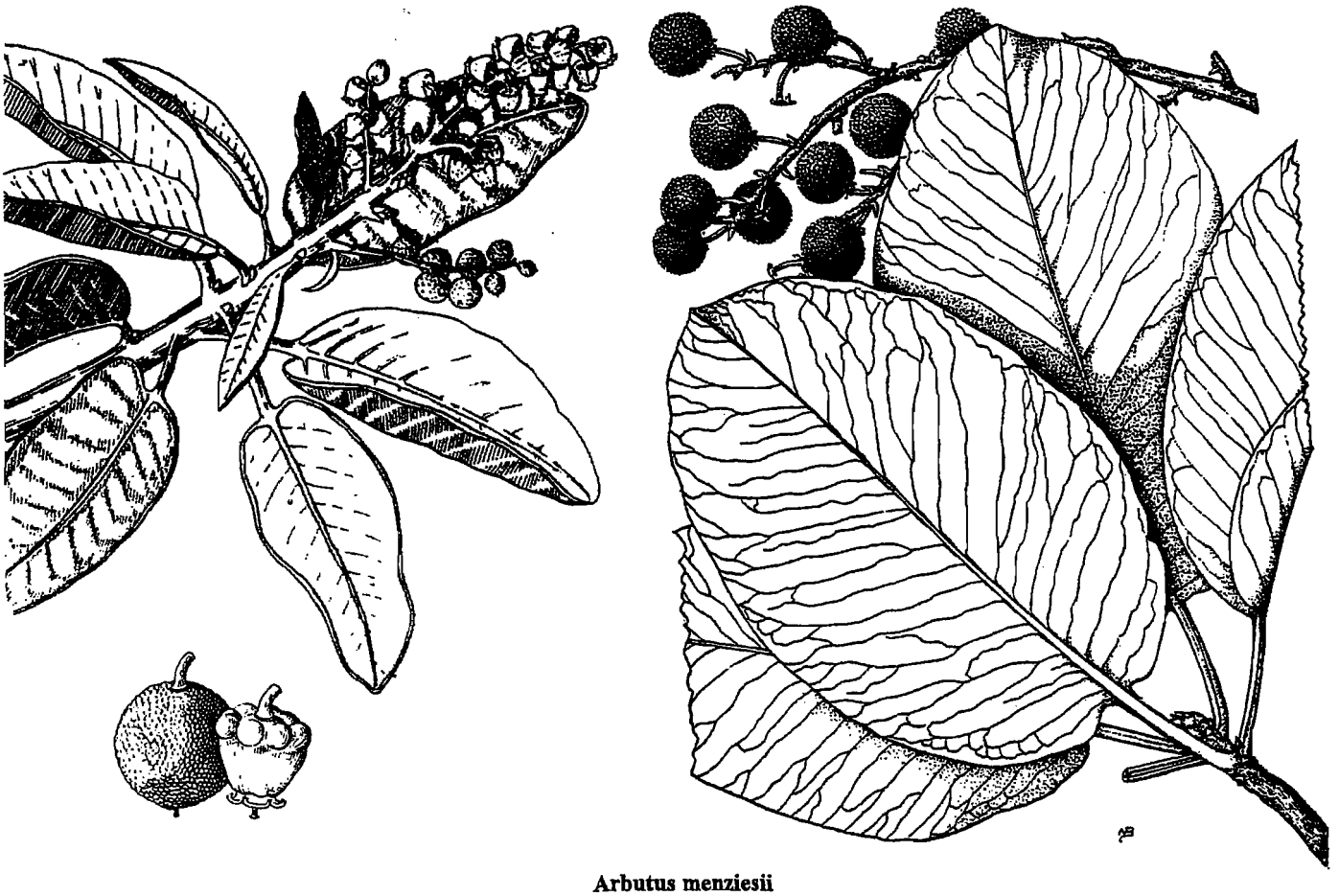


Cuscuta californica

Datisca glomerata

Arctostaphylos glandulosa

Arctostaphylos glauca



Arbutus menziesii

Arctostaphylos glandulosa Eastwood subsp. **zacaensis** (Eastwood) Wells. EASTWOOD'S MANZANITA, STICKY MANZANITA (p. 80). *HABIT*: evergreen shrubs with smooth brownish-red branches that form rounded crowns ranging from about 3 to 25 dm. (1 to 8') tall. Plants growing on or near the summit of ridges (where often in nearly pure stands) are often semi-prostrate. Older plants develop ground-level burls, from which new branches are quickly produced after fires. *LEAVES*: alternate and with petioles about 5 to 10 mm. long, the blades elliptic to ovate or obovate and about 1 to 4.5 cm. long. *INFLORESCENCE*: the flowers are clustered in nodding racemes that terminate the outer-most stems. *COROLLA*: urn-shaped, white, and about 6 to 8 mm. long. *FRUIT*: a sticky green berry about 6 to 10 mm. wide containing weakly consolidated stones. *OCCURRENCE*: widely scattered at higher to intermediate elevations in the Tassajara region, and locally abundant in many areas, especially on the summit of ridges. *DISTRIBUTION*: outer south Coast Ranges and western Transverse Ranges, from the Santa Lucia Mts. of Monterey Co. to Santa Barbara Co., and the western Peninsular Ranges, from the Santa Ana Mts. to northwestern Baja California. *NOTE*: Wells ('87) recognizes six subspecies within the *A. glandulosa* complex, and three forms within subsp. *zacaensis*. Most of the plants in the Tassajara region seem to best fit the descriptions of forma *howellii* (Eastwood) Wells [*A. g.* var. *howellii* (East-wood) Adams ex McMinn] and forma *glaucoides* Wells. It is likely that the subsp. *zacaensis* complex represents a polytopic hybridization of typical *A. glandulosa* with *A. glauca*. ⊛Feb.-April.

Arctostaphylos glauca Lindley. BIG-BERRY MANZANITA (p. 80). *HABIT*: sometimes arborescent evergreen shrubs ranging from about 2 to 8 m. (6.5-26') tall, with branches which often exhibit a fairly tortuous habit of growth. The bark is very smooth and brownish-red. *LEAVES*: alternate and with petioles about 7 to 15 mm. long, the blades gray-green and glaucous, oblong to elliptic or ovate with entire or sometimes toothed margins, and about 2 to 5 cm. long. *INFLORESCENCE*: flowers are clustered in nodding racemes which terminate the outer-most stems. *COROLLA*: urn-shaped, white with a pinkish tinge, and about 8 to 9 mm. long. *FRUIT*: a roundish to ovoid berry about 12 to 15 mm. wide. The fruit is covered by a thin and sticky green skin that surrounds solidly fused stones. *OCCURRENCE*: common in chaparral and open areas at lower to intermediate elevations of the Tassajara region, and one of the most conspicuous and well known of the shrubs in this region. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Contra Costa Co. (Mt. Diablo) to northern Baja California. ⊛Dec.-March.

CHIMAPHILA. PIPSISSEWA, PRINCE'S PINE.

About four or five species of perennial herbs of boreal and temperate-montane Eurasia and North America, with one species extending to the mountains of Central America.

⇕**Chimaphila menziesii** (Brown ex Don) Sprengel. WESTERN PIPSISSEWA, LITTLE PRINCE'S PINE (p. 85). *HABIT*: small evergreen perennial herbs with stems ranging from about 1 to 1.5 (4-6") tall. *LEAVES*: ~~short petiolate and about 1.5 to 3.5 cm. long, usually with~~ some alternate and some opposite (and often with some whorled in three's or more), the blades ovate to lance-oblong, serrulate to entire, relatively thick, and shiny dark green above and paler below. *INFLORESCENCE*: the flowers are produced in terminal and sometimes axillary racemes ~~about~~ 4 to 5 ~~cm. long~~. *COROLLA*: five spreading petals about 5 to 6 mm. long. The petals are at first white but turn pinkish with

age. *FRUIT*: a five-celled capsule about 5 to 6 mm. wide. *OCCURRENCE*: lightly scattered in *Pinus ponderosa* dominated mixed evergreen forests along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, and along the Bear Basin Trail south of Pine Valley. The plants occur between about 3,200 and 4,800 ft. elevation. *DISTRIBUTION*: northern Rocky Mts. and the mountains of the Pacific Slope (mostly between 3,000 and 8,000 ft.), from British Columbia and Montana to the north Coast Ranges (as far south as the higher mountains of northern Lake Co.) and through the Sierra Nevada, with disjunct populations in the Santa Lucia Mts. of Monterey Co., the Transverse Ranges (the San Gabriel & San Bernardino Mts.), and on Mt. Palomar and the Cuyamaca Mts. of the Peninsular Ranges (San Diego Co.). *NOTE*: this species is re-ported to be uncommon throughout its range. ⊛June-Aug.

EUPHORBIACEAE. SPURGE FAMILY.

A large, highly variable, and primarily tropical and subtropical family comprised of about 300 genera and 7,500 species. The plants range from small annual herbs to tall trees. The family includes many ornamentals (perhaps the best known of which is *Poinsettia*), many very exotic and cactus-like plants, some plants of economic importance, such as tung-oil trees (*Aleurites*) and para rubber trees (*Hevea*), and a few food-producing plants, such as the cassava shrub (*Manihot*) from which tapioca is derived. The Family also includes many highly toxic plants, such as Castor Bean (*Ricinus communis*).

1a. Plants tufted and often sprawling, gray-green, and aromatic. Calyces present. . . . . ***Eremocarpus.***
1b. Plants erect, green, and non-aromatic. Calyces absent. . . . . ***Euphorbia.***

EREMOCARPUS. TURKEY MULLEIN, DOVE WEED.

One species of temperate western North America.

Eremocarpus setigerus (Hooker) Bentham (p. 85). *HABIT*: aromatic gray-green annual herbs with prickly-hairy stems which form small to large tufts ranging from about 1 to 8 dm. (4-32") wide. The plants are xerophytic, thus most of the growth occurs during the dry season. *LEAVES*: generally alternate but often opposite upward on the stems, the petioles about 1 to 5 cm. long, the blades ovate to orbicular and about 1 to 6 cm. long. *INFLORESCENCE*: the flowers are small and inconspicuous, with the staminate flowers produced in terminal corymbs and the pistillate flowers produced in the axils of the leaves. *FRUIT*: a one-seeded capsule about 4 mm. wide. *OCCURRENCE*: scattered in open grasslands along the Church Creek Fault, such as in the Adobe, Horse Pasture and Caves areas, and occasionally on the floodplains of Tassajara Creek. *DISTRIBUTION*: western North America, from Washington to southern California. ⊛May-Oct.

EUPHORBIA. SPURGE.

About 1,500 species of annual & perennial herbs and subshrubs. The species are mostly of tropical, subtropical and warmer-temperate regions.

Euphorbia spathulata Lamarck [*E. dictyosperma* Fischer & Meyer]. WART-FRUITED SPURGE, RETICULATE-SEEDED SPURGE (p. 85). *HABIT*: annual herbs with erect and fairly slender stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: about .5 to 3 cm. long, the lower leaves are smaller, alternate, short petiolate, and generally obovate-spatulate, while the larger upper-most leaves are opposite, mostly sessile, and oblanceolate to broadly ovate. *INFLORESCENCE*: flowers are small and produced in the axils of the upper leaves. *FRUIT*: a roundish, three-lobed and minutely warty capsule about 2 to 3 mm. wide. *OCCURRENCE*: although I have found this species only at three sites in the Tassajara region (in an opening in chaparral along Tony's Trail, on a loose-soiled slope in a woodland habitat along Tony's Trail, and in a grassy opening in woodlands along the Horse Pasture Trail), it is probably more widely distributed in this region, for the plants are fairly inconspicuous and easily overlooked. *DISTRIBUTION*: widely distributed in the Americas, from Washington and the eastern United States to South America. ⊛March-June.

Notes on *Euphorbiaceae*.

Euphorbiaceae species which are reported from areas of the Santa Lucia Mts. near or relatively near the Tassajara region include: *Euphorbia crenulata*, *Chamaesyce serpyllifolia* and *C. serpyllifolia* subsp. *hirtula*. *Euphorbia peplus* has been a common weed in and around the gardens at Tassajara Hot Springs.

FABACEAE (*Leguminosae*). PEA, BEAN OR LEGUME FAMILY.

With about 650 genera and approximately 18,000 species, *Fabaceae* is the third largest family of vascular plants. It is also one of the most important areas of life in regards to the development and maintenance of human civilization, a role that is probably second only to that of *Poaceae* (the Grass Family). The many types of beans or legumes (including lentils, peas, peanuts, etc.) are exceedingly important food sources, and when combined with a carbohydrate-rich foods (such as the grains of *Poaceae*), they provide a balanced source of primary human nutrition. Many plants, such as alfalfa, soybeans, and semi-domesticated or feral species, are used extensively as forage or feed for livestock, which results in other major sources of nutrition for mankind, such as meats, milk (and other dairy products) and eggs. A large number of *Fabaceae* species have been domesticated simply for their ornamental appeal.

Fabaceae is divided into three subfamilies (considered by some to be distinct), two of which, *Mimosoideae* (about 40 genera and 2,000 species, including *Mimosa*, *Acacia* and *Prosopis*, the mesquites) and *Caesalpinioideae* (about 150 genera and 2,200 species, including *Cercidium* and *Parkinsonia*, the paloverdes of the southwest), are comprised mostly of tropical and subtropical trees and shrubs. The third

and by far the largest subfamily, *Papilionoideae*, is comprised mostly of annual and perennial herbs (but includes shrubs and trees) which occur mostly in temperate regions. The flowers of *Papilionoideae* are very distinctive, for they have five petals arranged in three asymmetrical series. The upper and usually largest petal is known as the banner or standard. The two lateral petals are known as the wings, which often obscure the two innermost (and often united) petals, which are known (collectively) as the keel. The wings and keel are partially united in some genera.

All of the *Fabaceae* species of the Tassajara region, both native and alien, belong to *Papilionoideae*. At least 42 taxa occur in this region, 38 of which are native, and 29 belong to only three genera: *Lupinus* (lupine), *Lotus* (trefoil), and *Trifolium* (clover).

1a. Vines or vine-like plants. Stems and/or leaves terminating with coiling and griping tendrils that allow the plant to climb on other objects:
2a. Styles with a line of hairs along upper margin just below stigma. Wings and keel joined for less than half the length of the keel. . . . . ***Lathyrus***.
2b. Styles with a ring of hair just below stigma. Wings and keel joined for more than half the length of the keel. . . . . ***Vicia***.
1b. Plants not vine-like. Stems and/or leaves not terminating with tendrils:
3a. Stipules large and leaflet-like. Stamens distinct to the very base. . . . . ***Thermopsis***.
3b. Stipules (if present) never similar to the leaflets in size or shape. Stamens united or 9 or 5 united:
4a. Leaves palmately divided into 4 or more leaflets. . . . . ***Lupinus***.
4b. Leaves not palmately divided, or if so, the leaflets are in 3's:
5a. Leaves divided into 4 or more leaflets:
6a. Flowers produced singularly or in few to many-flowered umbellate clusters. Legume not inflated with age. . . . . ***Lotus***.
6b. Flowers produced in many-flowered racemes. Legume more or less strongly inflated with age. . . . . ***Astragalus***.
5b. Leaves divided into 3 leaflets:
7a. Leaflets relatively large and broad (lance-ovate to roundish and 2 to 8 cm. long), and dotted with sticky glands:
8a. Racemes relatively long and spike-like. Banner and wings at least partially purple or blue. Plants of riparian habitats. . . . . ***Hoita***.
8b. Racemes relatively short and not spike-like. Banner and wings greenish or yellowish-white, keel purple-tipped. Plants of woodlands or sometimes chaparral. . . . . ***Rupertia***.
7b. Leaflets relatively small (mostly less than 2.5 cm. long, but if longer, then narrowly oblanceolate to narrowly linear), and not dotted with sticky glands:
9a. Leaflet margins entire. . . . . ***Lotus***.
9b. Leaflet margins serrate or toothed (sometimes obscurely so):
10a. Flowers borne in dense and head-like terminal clusters. Leaves palmately divided. Legumes obscured within the calyces. . . . . ***Trifolium***.
10b. Flowers borne in racemes, spikes, or small loosely-flowered clusters. Leaves pinnately divided. Legumes fully exposed in maturity:
11a. Legumes straight (except for the style). . . . . ***Melilotus***.
11b. Legumes curved or spirally coiled. . . . . ***Medicago***.

ASTRAGALUS. MILK-VETCH, LOCOWEED, RATTLE-WEED.

With about 2,000 species worldwide, *Astragalus* is perhaps the largest genera of flowering plants. Most of the species occur in areas of with Mediterranean or continental climates in northern-temperate regions. Although 94 species plus numerous lesser taxa occur in California (many of which are uncommon to very rare), only two taxa are known to occur in the Tassajara region.

1a. Annual herbs with erect or ascending stems. Corolla mostly 2.5 to 3.3 mm. long. Legume less than 4 mm. wide and not strongly upwardly curved. . . . . ***A. gambellianus***.
1b. Perennial herbs with more or less prostrate stems radiating outward from the root-crown. Corolla about 1 cm. long. Legume about 5 to 10 mm. wide and strongly upwardly curved. . . . . ***A. lentiginosus***.

Astragalus gambellianus Sheldon [*A. nigrescens* Nuttall]. DWARF LOCOWEED, LITTLE-BILL LOCO (p 85). *HABIT*: small annual herbs with slender and generally ascending stems ranging from about .5 to 3 dm. (2-12") long. *LEAVES*: alternate, about 1 to 4 cm. long, and pinnately divided into 7 to 15 narrowly cuneate-oblong leaflets about 1 to 9 mm. long. The leaflets are commonly notched at the apex. *INFLORESCENCE*: flowers are small and produced in 4 to 15 flowered racemes terminating slender peduncles that arise from the axils of the upper leaves. The racemes are at first crowed, but become more spacious with age. *COROLLA*: the petals are mostly white with a tinge of violet, and the banner is about 2.5 to 3.3 mm. long. *LEGUME*: small, deflexed, two-seeded, ovate to roundish when viewed from above, and about 3 to 4 mm. long. *OCCURRENCE*: scattered in open grasslands and savannas in the Horse Pasture and in Pine Valley. Although this species was not seen elsewhere in this region, it is probably more widespread, for the plants are rather inconspicuous and easily overlooked. *DISTRIBUTION*: Coast Ranges and mountains of southern California, from southwestern Oregon to northern Baja California, and the Sierra Foothills, from Shasta Co. to Fresno Co. ⊛April-June. **Astragalus lentiginosus** Hooker **var. idriensis** Jones [*A. l.* (Jones) Abrams]. NEW IDRIA FRECKLED MILK-VETCH (p 85). *HABIT*: perennial herbs with several prostrate or ascending stems ranging from about 1 to 4 dm. (4-16") long. The stems typically radiate outward from the root-crown. *LEAVES*: alternate, about 1 to 4 cm. long, and pinnately divid-ed into many small oblanceolate leaflets about 2 to 8 mm. long. The leaflets are often more or less truncate and sometimes notched at the apex. *INFLORESCENCE*: a relatively short few to many-flowered ter-minal raceme. *COROLLA*: the petals are pale creamy-white and most-ly about 1 cm. long. *LEGUME*: laterally inflated and strongly up-wardly curved (often with the apex nearly touching the base), and about 5 to 10 mm. wide. *OCCURRENCE*: all known references in bo-tanical literature to the existence of this taxon in the Santa Lucia Mts. are based on one of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June, 1901 (Elmer #3288 DS). According to a note enclosed in an envelope attached to the sheet, Elmer collected the specimen in "Pine Valley, toward round meadow, gravely, rocky soil." Plants still occur at this site (on the low rise between the English cabin and the large meadow north-northwest of the cabin), where I counted 36 plants on May 20, 1993. I did not find this taxon elsewhere in this region. *DISTRIBUTION*: the Mt. Hamilton Range of Santa Clara Co., San Benito Mt. (the type locality) of San Benito & Fresno Counties, the

Santa Lucia Mts. of Monterey Co. (Pine Valley), and scattered in the mountains surrounding the south-ern end of the San Joaquin Valley (the Temblor Range, San Rafael Mts, the Mt. Pinos region of the western Transverse Ranges, and the Tehachapi Mts.). *NOTE*: *Astragalus lentiginosus* is a very complex species, and 23 currently accepted varieties occur in California (Spellenberg in Hickman, ed. '93), many of which, according to the California Native Plant Society, are uncommon, rare or endangered. ⊛April-July.

HOITA. LEATHER-ROOT.

Three species of the California Floristic Province. Both the botanical and common names refer to the strongly fibrous roots, which the Pomos and probably other California Indian tribes used for binding. Segregated from *Psoralea*.

1a. Stems erect. Leaflets lance-ovate to ovate-rhombic. . . . . ***H. macrostachya***.
1b. Stems prostrate and rooting at the nodes. Leaflets round to round-obovate. . . . . ***H. orbicularis***.

Hoita macrostachya (deCandolle) Rydberg [*Psoralea m.* deCandolle]. LEATHER ROOT (p 85). *HABIT*: semi-shrubby perennials of riparian habitats, with erect or ascending branches ranging from about 6 to 30 dm. (2-10') tall. *LEAVES*: alternate and with petioles about 1 to 6 cm. long, the blades pinnately divided into 3 lance-ovate to ovate-rhombic leaflets about 2 to 10 cm. long. *INFLORESCENCE*: broadly cylindrical terminal spikes about 5 to 12 cm. long. *COROLLA*: about 8 to 10 mm. long; the petals are mostly bluish-purple. *LEGUME*: about 6 to 8 mm. long and containing 1 seed about 5 to 7 mm. long. *OCCURRENCE*: common along perennial streams nearly throughout the Tassajara region. *DISTRIBUTION*: in wet or moist habitats throughout most of the California Floristic Province (except for the Central Valley) below about 5,000 feet. ⊛May-Aug.

Hoita orbicularis Lindley [*Psoralea o.* (Lindley) Rydberg]. ROUND-LEAFED LEATHER-ROOT (p 85). *HABIT*: perennial herbs of streambed habitats with prostrate stems which root at the nodes. *LEAVES*: alternate and produced on erect petioles about 1 to 5 dm. (4-20") long; the blades are divided into 3 round or round-ovate leaflets about 3 to 8 cm. long. *INFLORESCENCE*: densely-flowered spike-like racemes about .5 to 3 dm. long, which are borne on erect peduncles about 2 to 7 dm. (8-28") tall. *COROLLA*: about 15 mm. long; the petals are mostly reddish-purple, and the banner often has a white spot on each side. *LEGUME*: about 8 mm. long and containing one ellipsoid seed about 5 mm. long. *OCCURRENCE*: scattered in wet habitats in the Tassajara region, such as in the bed of the Arroyo Seco River at the confluence of Tassajara Creek, in Pine and Strawberry Valleys, and on Chew's Ridge. *DISTRIBUTION*: in wet habitats throughout much of California. ⊛May-July.

LATHYRUS. WILD PEA, SWEET PEA.

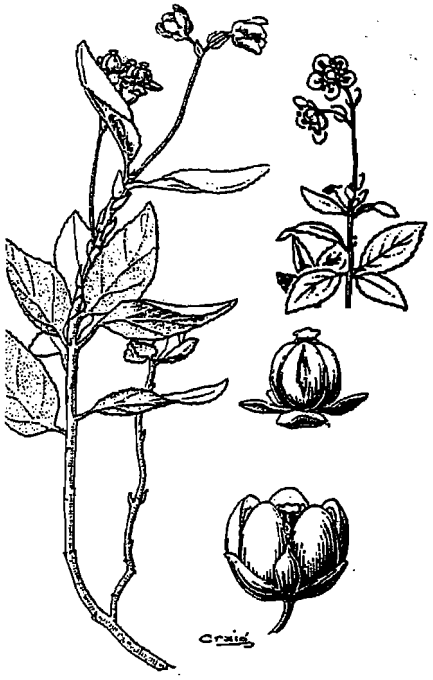
About 150 species of temperate North America and Eurasia. The showy-flowered sweet pea of gardens is *L. odoratus*.

Lathyrus vestitus Nuttall ex Torrey & Gray [*L. v.* subsp. *puberulus* (White) Hitchcock]. PACIFIC WILD PEA, HILLSIDE PEA (p 85). *HABIT*: pubescent evergreen perennial vines with lanky stems ranging from about 3 to 22 dm. (1-7') long. The stems climb on other plants by means of coiling tendrils. *LEAVES*: alternate and pinnately divided into about 10 broadly elliptic to narrowly oblong-lanceolate leaflets about 2 to 3.5 cm. long. *INFLORESCENCE*: 5 to 20-flowered axillary racemes. *COROLLA*: about 14 to 20 mm. long. The wings are white or nearly white, while the broad and upwardly bent banner is tinged bluish or reddish-lavender and marked with violet or darker hued veins. *LEGUME*: about 4 to 6 cm. long and looking much like a reduced version of a snow-pea pod. *OCCURRENCE*: widespread and common throughout much of the Tassajara region, except for treeless grasslands and dry southfacing chaparral slopes dominated by Chamise (*Andenostoma*). *DISTRIBUTION*: outer Coast Ranges, from Humboldt Co. to Santa Barbara Co. ⊛April-July.

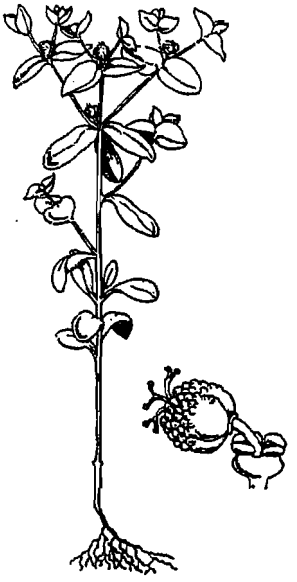
LOTUS. TREFOIL.

Although the common name "lotus" refers to the showy-flowered waterlilies of southern Asia, the botanical name refers a terrestrial-plant genus comprised of about 150 species of (primarily) northern-hemispheric plants. *Lotus* is well represented in the California Floristic Province, and at least 11 taxa occur in the Tassajara region.

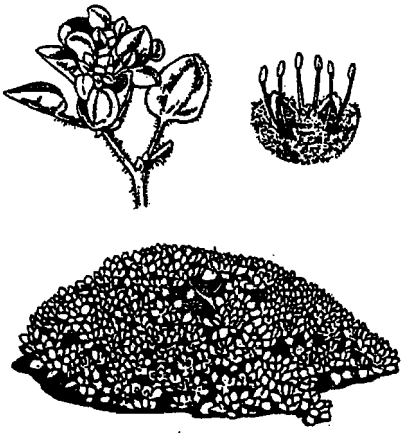
1a. Stipules expanded and membranaceous or leaf-like:
2a. Plants of wet streambed habitats. Leaflets narrowly oblong or elliptic. . . . . ***L. oblongifolius***.
2b. Plants of woodland or chaparral habitats. Leaflets broadly ovate to obovate. . . . . ***L. crassifolius***.
1b. Stipules reduced to dot-like glands:
3a. Legumes usually strongly curved and tapering to an elongated beak. Plants perennial:
4a. Broom-like subshrubs with a rounded crown comprised of numerous slender, ascending stems. . . . . ***L. scoparius***.
4b. Herbaceous plants with spreading prostrate stems:
5a. Inflorescence loosely 4 to 8 flowered. Corolla 6 to 10 mm. long; banner claws shorter than the blades. . . ***L. argophyllus argophyllus***.
5b. Inflorescence densely 10 to 15 flowered. Corolla 8 to 12 mm. long; banner claws scarcely shorter than the blades. . . . . ***L. argophyllus fremontii***.
3b. Legumes straight or mostly straight and abruptly constricting to a short (or sometimes elongated) beak:
6a. Plants perennial. Corollas 15 to 24 mm. long. . . . . ***L. grandiflorus***.
6b. Plants annual. Corollas 4 to 12 mm. long:
7a. Petals basically white, pink or pinkish (but may turn red with age):
8a. Branches mostly erect or ascending and up to 8 dm. (32 in.) long. Petals white with a tinge of rose, and not turning red with age. Leaves covered with fine hairs. . . . . ***L. purshianus***.
8b. Branches mostly prostrate (ascending only near ends), and usually less than 3 dm. (16 in.) long. Petals mostly pink, and often turning red with age. Leaves mostly bald. . . . . ***L. micranthus***.
7b. Petals basically yellow (but may turn red with age or be marked with red when still fairly young):
9a. Flowers one to several on peduncles usually more than 1 cm. long. . . . . ***L. strigosus***.
9b. Flowers solitary and nearly sessile:



Chimaphila menziesii



Eremocarpus setigerus



Euphorbia spathulata

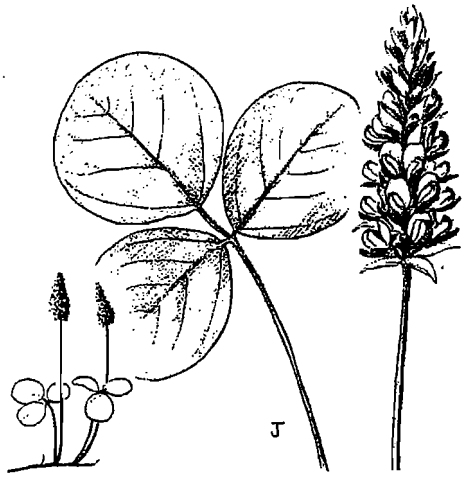
Hoita macrostachya

Astragalus lentiginosus idriensis

Astragalus gambellianus

var. argophyllus

var. fremontii



Hoita orbicularis

Lathyrus vestitus

Lotus argophyllus

10a. Leaves with a more or less dense coat of long spreading hairs. . . . . ***L. humistratus.***
10b. Leaves with a relatively sparse coat of short upwardly appressed hairs. . . . . ***L. wrangelianus.***

⇧**Lotus argophyllus** (Gray) Greene [*Hosackia argophylla* Gray]. SILVER-LEAFED LOTUS (p 85). *HABIT*: densely silvery-pubescent evergreen perennial herbs with prostrate to decumbent branches ranging from about 1 to 10 dm. (4-40") long. *LEAVES*: alternate and divided into 3 to 5 broadly oblanceolate to obovate leaflets about 4 to 12 mm. long. *INFLORESCENCE*: loosely flowered terminal umbels. *COROLLA*: about 6 to 10 mm. long; the petals are yellow with the banner turning brownish or purplish with age. *LEGUME*: about 4 mm. long, barely exceeding the lobes of the calyx, and containing 1 small seed. *OCCURRENCE*: I have seen this species in rocky areas along the Pine Ridge Trail a short distance east of the Church Creek Divide, and on sandstone outcrops along the lower portion of the Horse Pasture Trail, above Blackberry Creek. A. D. E. Elmer's Tassajara Hot Springs specimen of June 1901 (Elmer #3285 DS) was collected, according to a note enclosed in an envelope attached to the sheet, in "woods on ridge towards Ventana outlook northwest of Pine Valley." *DISTRIBUTION*: from the Santa Lucia Mts. of Monterey Co. in the Coast Ranges, and from Fresno Co. in the Sierra Foothills, to the mountains of southern California and northern Baja California. ⊛April-July.

⇧**Lotus argophyllus** var. **fremontii** (Gray) Ottley [*Hosackia f.* (Gray) Abrams] (p 85). *HABIT*: evergreen perennial herbs similar to the typical species, except for the characteristics listed in the key to the genus. Such plants also differ in being more robust in general habit, with more numerous and more densely foliated stems (the stems often form large spherical rosettes). *OCCURRENCE*: lightly scattered on the higher ridges of the Tassajara region, mostly in rocky areas or on steep and exposed slopes. The most accessible of the known sites is located along the road to The Caves, a short distance from the junction with Tassajara Road. The plants occur on rock outcrops on the upward side of the road cut. *DISTRIBUTION*: northern Sierra Nevada, from Placer Co. to Mariposa Co., with a disjunct population in the Santa Lucia Mts. of Monterey Co. *NOTE*: although Monterey Co. populations of this taxon have been reported in a number of botanical texts (re. Munz '59, Howitt & Howell '64, Griffin '75 and Matthews '97), they are not noted in the Jepson Manual (Hickman, ed., '93). ⊛April-July.

Lotus crassifolius (Bentham) Greene [*Hosackia crassifolia* Bentham]. BROAD-LEAFED LOTUS, BUCK LOTUS (p 87). *HABIT*: robust perennial herbs with arcing or erect stems ranging from about 4 to 12 dm. (16-48") long. The rather stout and fistulous stems wither away with the first frosts of winter, and new stems are produced in late spring or early summer. *LEAVES*: pinnately divided into 7 to 15 ovate to obovate leaflets about 1 to 3 cm. long. *INFLORESCENCE*: umbellate clusters borne on axillary peduncles about 3 to 8 cm. long. *COROLLA*: about 9 to 12 mm. long; the petals are greenish-yellow with purplish-red markings. *LEGUME*: rather narrow and about 3.5 to 6.5 cm. long, and containing about 7 to 12 seeds. *OCCURRENCE*: widely scattered and locally common in chaparral and sometimes wooded areas on the higher ridges of the Tassajara region. *DISTRIBUTION*: in mountainous areas along the Pacific Slope, from Washington to the mountains of southern California. ⊛May-Aug.

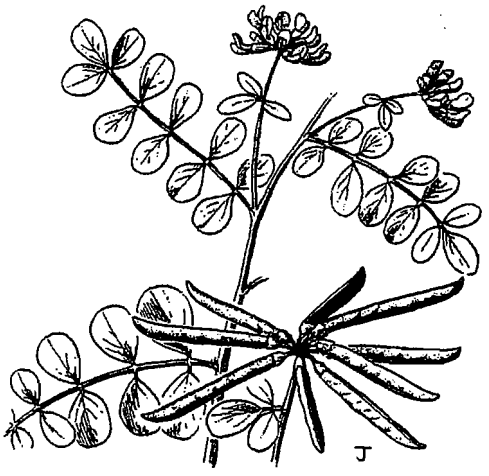
Lotus grandiflorus (Bentham) Greene [*L. g.* var. *mutabilis* Ottley, *Hosackia grandiflora* Bentham]. LARGE-FLOWERED LOTUS, CHAPARRAL LOTUS (p 87). *HABIT*: perennial herbs, sometimes slightly woody at the base, with stems ranging from about 2 to 7 dm. (8-28") tall. The stems wither away in winter and new stems are produced in the spring. *LEAVES*: alternate and pinnately divided into usually 7 to 9 obovate to elliptical-obtuse leaflets about 7 to 20 mm. long. *INFLORESCENCE*: the flowers are produced in umbels which terminate axillary peduncles about 4 to 8 cm. long. *COROLLA*: about 1.5 to 2.4 cm. long; the petals are at first yellow but turn red with age. *LEGUME*: narrow, about 3 to 4 cm. long, and containing seeds about 2 mm. long. *OCCURRENCE*: lightly scattered in openings in chaparral or wooded areas on the higher ridges of the Tassajara region. I have seen this species only along the Black Cone Trail between South Ventana Cone and the Elephant's Back. Vern Yadon ('79b) once found it on the summit of "Never Again Ridge" (the ridge between Church Creek and the upper-most portion of Tassajara Creek), and A. D. E. Elmer (Elmer #3286 DS) collected a specimen in "woods on ridge towards Ventana outlook northwest of Pine Valley" in June of 1901 (Howitt & Howell's listing of "Tassajara Springs" as a Monterey Co. site for this species was based on Elmer's specimen). Griffin ('75) reported the species to be uncommon on Chew's Ridge. *DISTRIBUTION*: from Shasta Co. southward, through the Coast Ranges and Sierra Nevada, to the mountains of southern California. ⊛April-July.

Lotus humistratus Greene [*Hosackia brachycarpa* Bentham]. SHORT-PODDED HILL LOTUS, COLCHITA (p 87). *HABIT*: small and densely whitish-pubescent annual herbs with semi-prostrate stems ranging from about .5 to 2 dm. (2-8") long. The plants often form small tufts. *LEAVES*: alternate and divided into 3 to 5 crowded obovate to oblanceolate leaflets about 4 to 12 mm. long. *INFLORESCENCE*: flowers are produced singularly in the axils of the leaves. *COROLLA*: about 5 to 9 mm. long; the petals are at first yellow but turn red with age. *LEGUME*: about 6 to 12 mm. long, mostly three-seeded, and covered with a rather dense coat of villous hairs. *OCCURRENCE*: lightly scattered in the Tassajara region, mostly on steep south-facing slopes with poor or loose soils. *DISTRIBUTION*: from Siskiyou Co. southward, through the Coast Ranges and Sierra Foothills, to northern Baja California, and eastward to New Mexico. ⊛April-June.

Lotus micranthus Bentham [*Hosackia parviflora* Bentham]. SMALL-FLOWERED LOTUS, HILL LOTUS (p 87). *HABIT*: small annual herbs with several slender and nearly prostrate stems radiating from the rootcrown. The stems range from about 1 to 3 dm. (4-12") long. *LEAVES*: alternate, about 1 to 1.5 cm. long, and pinnately divided into 3 to 5 oblong to oblanceolate or elliptical leaflets about 3 to 10 mm. long. *INFLORESCENCE*: flowers are very small and borne singularly in the axils of the leaves. *COROLLA*: about 4 or 5 mm. long; the petals range from pinkish-white to nearly red. *LEGUME*: slender, about 1.5 to 2 cm. long, and containing about 5 to 9 seeds. *OCCURRENCE*: widespread and locally common to abundant in more or less grassy areas in the Tassajara region. *DISTRIBUTION*: Pacific Slope, from British Columbia to southern California. ⊛April-June.

Lotus oblongifolius (Bentham) Greene [*L. o.* var. *nevadensis* (Gray) Munz, *Hosackia oblongiflora* Bentham]. NARROW-LEAFED STREAM LOTUS (p 87). *HABIT*: perennial herbs of wet habitats, with erect or ascending stems ranging from about 2 to 5 dm. (8-20") tall. *LEAVES*: alternate and pinnately divided into 7 to 11 elliptical to linear-lanceolate leaflets about 5 to 20 mm. long. *INFLORESCENCE*: umbellate clusters borne on axillary peduncles about 5 to 12 cm. long. *COROLLA*: about 9 to 14 mm. long; the petals are yellow with red-veining on the banner, but tend to be reddish throughout when immature or aging. *LEGUME*: narrowly linear and about 2.5 to 4 cm. long; the seeds are about 1.5 to 2 mm. wide. *OCCURRENCE*: widely scattered in wet and usually sunny areas along the banks of the perennial streams in the Tassajara region. *DISTRIBUTION*: Cascades, Sierra Nevada, Coast, Transverse and Peninsular Ranges, from Oregon to San Diego Co. ⊛May-Sept.

Lotus purshianus (Bentham) Clements & Clements [*Hosackia americana* (Nuttall) Piper]. SPANISH CLOVER (p 87). *HABIT*: annual herbs with erect to ascending stems about 1.5 to 8 dm. (6-32") long. *LEAVES*: alternate, about 1 to 2.5 cm. long, and divided into 3 (or sometimes more) oblong to elliptical (or asymmetrically ovate) leaflets about 10 to 15 mm. long. *INFLORESCENCE*: the flowers are produced singularly in the axils of the leaves. *COROLLA*: about 4 to 7 mm. long; the petals vary from creamy-white to dark-pink. *LEGUME*: about 1.5 to 2.5 cm.



Lotus crassifolius

Lotus grandiflorus

Lotus humistratus

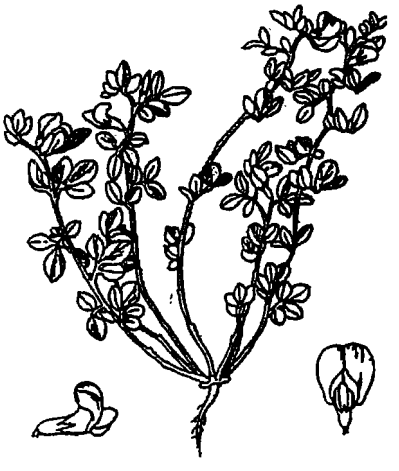
Lotus micranthus

Lotus oblongifolius

Lotus purshianus

Lotus scoparius

Lotus strigosus



Lotus wrangelianus

long and 2 to 2.5 mm. wide, and containing about 3 to 7 seeds about 3 mm. in diameter. *OCCURRENCE*: generally common in the Tassajara region, and found in nearly all habitat types. *DISTRIBUTION*: from British Columbia to the northern Great Plains, and southward along the Pacific Slope to northern Baja California. ⊛May-August (-Oct.).

Lotus scoparius (Nuttall) Ottley [*Hosackia glabra* (Vogel) Torrey]. DEER WEED, CHAPARRAL BROOM, CALIFORNIA BROOM (p 87). *HABIT*: broom-like subshrubs tending to form rounded crowns comprised of numerous erect and ascending stems. The stems are rather slender and range from about 4 to 12 dm. (16-48") long. *LEAVES*: alternate, nearly sessile, and divided into 3 (or sometimes 4 or 5) oblong or oblanceolate leaflets about 4 to 15 mm. long. *INFLORESCENCE*: the flowers are borne in umbellate or whorled clusters which are sessile in the axils of the leaves. *COROLLA*: about 7 to 12 mm. long; the petals are yellow or sometimes tinged red. *LEGUME*: upwardly curved, about 1 to 1.5 cm. long, and containing 2 seeds about 1.5 to 2 mm. long. *OCCURRENCE*: locally common in the Tassajara region, primarily in open areas within chaparral. *DISTRIBUTION*: Coast Ranges, from Humboldt Co. southward, and the Sierra Foothills, from Plumas Co. southward, to northern Baja California. *NOTE*: this species was extremely abundant in this region for the first few years after the Marble-Cone Fire of 1977. During that time the canyon's walls changed color according to this plant's yearly cycle: from green during the winter and spring, to yellow during the peak flowering season (late May to early July), to reddish as the flowers aged, then returning to green for a few weeks. As the leaves started to wither and fall, the slopes turned rusty-red for about a month or so, then turned grayish for the rest of the dry season, for only the dormant stems remained. ⊛March-Aug.

Lotus strigosus (Nuttall) Greene [*Hosackia strigosa* Nuttall] (p 87). *HABIT*: annual herbs with several trailing or ascending stems ranging from about .5 to 3 dm. (2-12") long. *LEAVES*: alternate, about 1 to 2.5 cm. long, and divided into 4 to 10 small linear-oblong to elliptic leaflets about 5 to 12 mm. long. *INFLORESCENCE*: flowers are borne on slender axillary peduncles usually more than 1 cm. long, with the lower peduncles usually 1-flowered while the upper are usually 2 or 3-flowered. *COROLLA*: about 6 to 10 mm. long; the petals are basically yellow, but are often marked with red. *LEGUME*: slender, about 1 to 3.5 cm. long, and containing nearly square seeds about 1 mm. wide. *OCCURRENCE*: widespread and locally common in the Tassajara region, primarily in open grassy areas and in openings in chaparral. *DISTRIBUTION*: Coast Ranges, from Marin Co. southward, and in the Sierra Foothills, from Sutter Co. southward, to northern Baja California. ⊛March-June.

Lotus wrangelianus Fischer & Meyer. CALIFORNIA LOTUS (p 87). *HABIT*: annual herbs with several decumbent to ascending stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: alternate, mostly less than 3 cm. long, and divided into (usually) 4 elliptic to obovate leaflets about 4 to 15 mm. long. *INFLORESCENCE*: flowers are nearly sessile and borne singularly in the axils of the leaves. *COROLLA*: about 5 to 9 mm. long; the petals are at first yellow, but become tinged with red with age. *LEGUME*: oblong, about 10 to 18 mm. long, and containing seeds about 1.5 to 2 mm. long. *OCCURRENCE*: widely scattered and locally common in open and grassy habitats in the Tassajara region. *DISTRIBUTION*: widespread in the California Floristic Province, and common to abundant in many areas. *NOTE*: this taxon has often been mistaken for the Chilean *L. subpinnatus* Lagasca. ⊛ March-June.

LUPINUS. LUPINE. BLUE BONNET.

About 200 species mostly of temperate western North America, but also of eastern-temperate North America, western-temperate South America (Chile and adjacent Argentina), tropical South America and in regions surrounding the Mediterranean Sea. The genus is particularly well represented in California, where 71 species (not including lesser taxa) occur, 41 of which are endemic to the California Floristic Province. Some Californian species are now weedy in other parts of temperate North America, South America, Australia and South Africa.

1a. Shrubs, subshrubs and perennial herbs. The foliage is evergreen, but may wither to some extent due to excessively dry or cold conditions:
2a. Erect woody-branched shrubs ranging from about 6 to 20 dm. (2-6.5 ft.) tall. . . . . ***L. albifrons albifrons***.
2b. Tufted or spreading woody-based subshrubs, commonly forming densely foliated mats. . . . . ***L albifrons abramsii***.
2c. Plants herbaceous throughout, and never forming spreading mats:
3a. Plants arising from a more or less vertical taproot. Leaves concentrated toward the base of the plant; leaflets broadly oblanceolate to long-obovate (mostly 10 to 30 mm. wide). . . . . ***L. cervinus***.
3b. Plants rhizomatic, the stems rising from the ground independently. Leaves well distributed on the stems; leaflets narrowly oblanceolate (mostly 5 to 15 mm. wide). . . . . ***L. formosus***.
1b. Annual herbs. The entire plant disintegrates by mid-summer at the latest:
4a. Banners yellow, wings rose-pink. . . . . ***L. stiversii***.
4b. Petals basically white, but may be tinged with yellow and/or streaked with lavender. . . . . ***L. microcarpus densiflorus***.
4c. Petals mostly blue, reddish-purple or lavender. Banners typically with a white or yellowish patch in lower center, which changes color (usually to a reddish to purplish shade) after fertilization:
5a. Most flowers produced in distinct whorls:
6a. Keel ciliate on lower margin near base. Leaves semi-succulent, major stems usually hollow. Rare in this region. . . . ***L. succulentus***.
6b. Keel not ciliate on lower margin. Leaves not succulent, stems solid. Common to abundant:
7a. Flowers 8 to 15 mm. long, pedicels 3 to 5 mm. long. . . . . ***L. nanus***.
7b. Flowers 4 to 8 mm. long, pedicels 0 to 3 mm. long. . . . . ***L. bicolor***.
5b. Flowers produced singularly (the inflorescence can be densely to loosely flowered):
8a. Upper leaves usually intermixed with lower flowers. Leaves with relatively dense gray-green hairs. Keel glabrous or nearly so. . . . . ***L. concinnus***.
8b. Upper leaves positioned below the lower flowers. Leaves prickly-hairy or nearly bald. Keel ciliate toward base:
9a. Leaves and stems nearly bald (hairs are sparse, minute and upwardly appressed). Leaflets narrowly linear and truncated (squared) at the apex. . . . . ***L. truncatus***.
9b. Leaves and stems covered with long, stiff, prickly hairs. Leaflets broadly cuneate-obovate and rounded at the apex. . . . . ***L. hirsutissimus***.

Lupinus albifrons Bentham. SILVER BUSH LUPINE (p 90). *HABIT*: erect evergreen shrubs with woody branches ranging from about 6 to 15 dm. (2-5') tall. The leaves and stems are covered with a dense layer of silky and upwardly appressed hairs, giving the plants a silvery appearance. *LEAVES*: alternate and with petioles about 2 to 5 cm. long, the blades are palmately divided into 6 to 10 oblanceolate to spatulate leaflets about 1 to 3 cm. long. *INFLORESCENCE*: the flowers are about 9 to 16 mm. long, and borne in more or less pyramidal terminal spikes up to 25 cm. long. *COROLLA*: the petals are mostly reddish-purple or lavender, with a pale patch in the center of the banner. *LEGUME*: about 3 to 5 cm. long and containing 5 to 9 seeds. *OCCURRENCE*: scattered in open areas along the Arroyo Seco River and the lower portion of Tassajara Creek, and extending westward to a short distance up Willow Creek beyond the confluence with Tassajara Creek (at Tassajara Camp). *DISTRIBUTION*: Coast Ranges, from Humboldt Co. to Ventura Co., and the Sierra Foothills, from Shasta Co. to Tulare Co. ⊛March-June.

○**Lupinus albifrons** var. **abramsii** (Smith) Hoover [*L. abramsii* Smith]. ABRAMS' SANTA LUCIA LUPINE (p 90). *HABIT*: whitish-woolly and densely-foliated evergreen subshrubs with decumbent to ascending stems about 2 to 6 dm. (8-24") long. Older plants often form very large mats produced by woody branches up to a meter or so in length, which spread outward from the root-crown (this habit of growth is quite evident in the remains of a dead plant). *LEAVES*: alternate and on petioles about .5 to 7 cm. long, the blades palmately divided into 8 (or sometimes 9) generally oblanceolate leaflets mostly between 1 and 2 cm. long (but may be up to 3 cm. long). The leaflets vary from acute to obtuse at the apex. *INFLORESCENCE*: the flowers are about 10 to 16 mm. long and borne in densely to loosely-flowered spike-like racemes. *COROLLA*: the petals are mostly reddish-lavender to reddish-purple (or sometimes bluish-purple), with a yellowish patch on the banner. *LEGUME*: about 2 to 4 cm. long and 5 to 9-seeded. *OCCURRENCE*: widespread and locally common to abundant in open and usually rocky area on the higher ridges of the Tassajara region, but rarely encountered below about 2,500 ft. *DISTRIBUTION*: endemic to the Santa Lucia Mountains of Monterey Co. and northwestern San Luis Obispo Co. *NOTE*: many of the local plants have a pubescence that is more or less upwardly appressed instead of woolly or shaggy, thus suggesting the also low-growing *L. a.* var. *collinus* Greene. ⊛April-August (but mostly May-June).

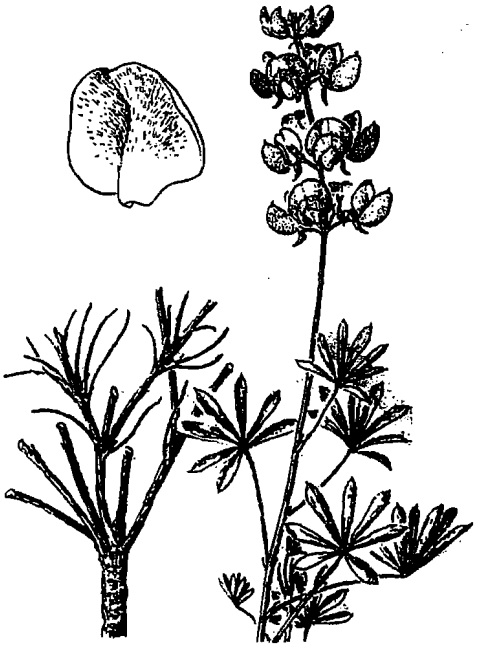
Lupinus bicolor Lindley [*L. b.* subsp. *tridentatus* (Eastwood) Dunn]. MINIATURE SKY LUPINE, DOVE LUPINE (p 90). *HABIT*: small villous-pubescent annual herbs with erect or ascending stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: alternate, the petioles are about 2 to 7 cm. long, and the blades are palmately divided into 5 to 7 oblanceolate to cuneate leaflets about 1 to 3 cm. long. *INFLORESCENCE*: the flowers are mostly whorled in relatively short terminal spikes. *COROLLA*: the petals are blue and the banner, which is about 6 to 9 mm. long, has a central white spot which turns reddish-purple after fertilization. *LEGUME*: about 1 to 3 cm. long and five to eight-seeded. *OCCURRENCE*: widespread and locally common in open and grassy habitats in the Tassajara region. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California. *NOTE*: all of the closely observed plants of this region were referable to what was recognized by Dunn ('55) as subsp. *tridentatus*. ⊛March-June.

○**Lupinus cervinus** Kellogg [*L. latissimus* Greene]. SANTA LUCIA LUPINE, DEER LUPINE (p 90). *HABIT*: velvety-pubescent evergreen perennial herbs with flowering stems ranging from about 1.5 to 4.5 dm. (6-18") tall. *LEAVES*: alternate and with petioles as much as 20 cm. long, and divided into 5 to 8 rather large oblong-ovate to broadly oblanceolate leaflets up to 6 cm. long and 3 cm. wide. *INFLORESCENCE*: the flowers are about 14 to 16 mm. long and fairly crowed in terminal racemose spikes about 12 to 20 cm. long. *COROLLA*: the petals range from medium purplish blue (personal observation) to perhaps light-blue (reference texts). *LEGUME*: about 3 cm. long and four to seven-seeded. *OCCURRENCE*: scattered on the higher ridges of the Tassajara region, and occurring in both mixed evergreen forests and more or less open areas in chaparral. The most accessible of the known sites is located along the Pine Ridge Trail between Tassajara Road and the first summit to the west, where the species is lightly scattered in woodlands. The species is locally common along the Black Cone Trail between South Ventana Cone and the Elephant's Back, and, according to Vern Yadon ('80f), also on the summit of the Elephant's Back. Yadon noted an abundant population on the "northwesterly extensions of ridge [the Elephant's Back], more than I have ever seen before." *DISTRIBUTION*: endemic to the Santa Lucia Mountains of Monterey County and northwestern San Luis Obispo County. *NOTE*: A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3292 DS) served as the type for Greene's *L. latissimus*. According to a note enclosed in an envelope pasted to the sheet, Elmer collected the specimen in "Pine Valley, pine woods toward Bear Basin." ⊛May-July.

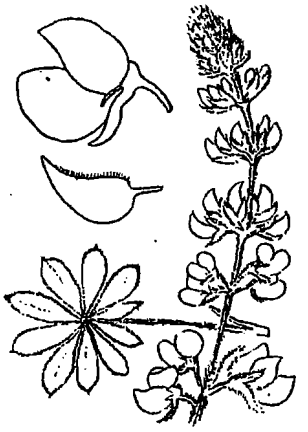
⇧**Lupinus concinnus** Argardh [*L. c.* var. *agardhianus* (Heller) Smith]. BAJADA LUPINE, ELEGANT LUPINE (p 90). *HABIT*: small and densely hispid annual herbs with one to many erect to spreading stems ranging from about .5 to 2 dm. (2-8") long. *LEAVES*: alternate, the petioles are about 1 to 6 cm. long, and the blades are palmately divided into five to nine narrowly oblanceolate leaflets about .5 to 2 cm. long. *INFLORESCENCE*: the flowers are about 7 to 9 mm. long and borne in terminal racemes. The lower flowers are usually intermixed with the upper leaves. *COROLLA*: the petals are rich purplish-blue, often lined with reddish-purple, with a white or yellowish blotch in the center of the banner. *LEGUME*: about 1 to 1.5 cm. long, hairy, and 2 to 4-seeded. *OCCURRENCE*: widely scattered but uncommon in the Tassajara region, and found mostly on highly exposed slopes with loose, rocky or poor soils. *DISTRIBUTION*: from Monterey Co. in the Coast Ranges, and from Fresno Co. in the Sierra Foothills, to northern Baja California, and eastward to Utah, Texas and northern Mexico. ⊛April-May.

Lupinus formosus Greene [*L. f.* var. *bridgesii* (Watson) Greene]. LUNARA LUPINE, SUMMER LUPINE, LATE LUPINE (p 90). *HABIT*: pubescent perennial herbs typically with a number of more or less erect stems rising from a creeping rhizome. The stems are mostly about 3 to 8 dm. (12-32") tall. *LEAVES*: alternate, the petioles are about 3 to 7 cm. long, and the blades are palmately divided into 7 to 9 narrowly oblanceolate leaflets about 3 to 7 cm. long. *INFLORESCENCE*: the flowers are about 12 to 14 mm. long and borne in terminal racemes about 10 to 25 cm. long. *COROLLA*: the petals are mostly blue-violet but are sometimes nearly colorless. *LEGUME*: about 3 to 3.5 cm. long and 5 to 7-seeded. *OCCURRENCE*: locally common along the Pine Ridge Trail (between the first summit west of China Camp and the Church Creek Divide) and in Pine Valley. Elsewhere in the Tassajara region this species is widely scattered at all elevations, but generally uncommon. *DISTRIBUTION*: Coast Ranges, from Humboldt and Siskiyou Counties southward, and Sierra Nevada, from Butte County southward, to northern Baja California. *NOTE*: most of the plants in this region, with their spreading pubescence, correspond to what was recognized by Greene as var. *bridgesii*. ⊛April-October (mostly May-June).

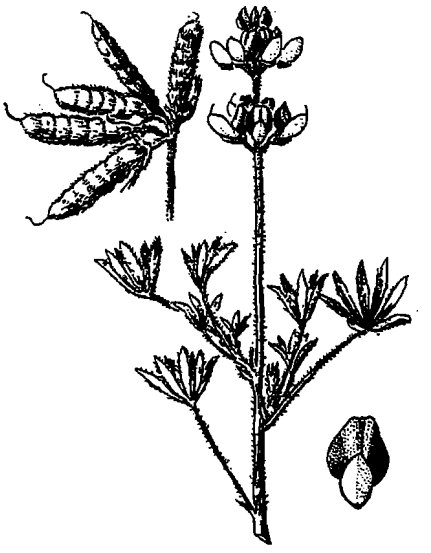
Lupinus hirsutissimus Bentham. STINGING LUPINE, NETTLE LUPINE. (p 90) *HABIT*: prickly annual herbs with generally erect stems ranging from about 3 to 10 dm. (12-40") tall. The stems are rather stout and often hollow. *LEAVES*: alternate and on petioles 5 to 18 cm. long, the blades palmately divided into five to eight broadly cuneate-obovate leaflets about 2 to 5 cm. long. *INFLORESCENCE*: the flowers are about 13 to 15 mm. long and scattered on elongated terminal spikes up to 25 cm. long. *COROLLA*: the petals are mostly reddish-purple or violet, or sometimes purplish-blue, with a yellowish-white patch near the base of the banner. *LEGUME*: about 2.5 to 3.5 cm. long, bristly, and 6 to 8-seeded. *OCCURRENCE*: widely scattered and locally common in the region, mostly in open and sunny (and often rocky) habitats. *DISTRIBUTION*: Coast Ranges and coastal southern



Lupinus albifrons

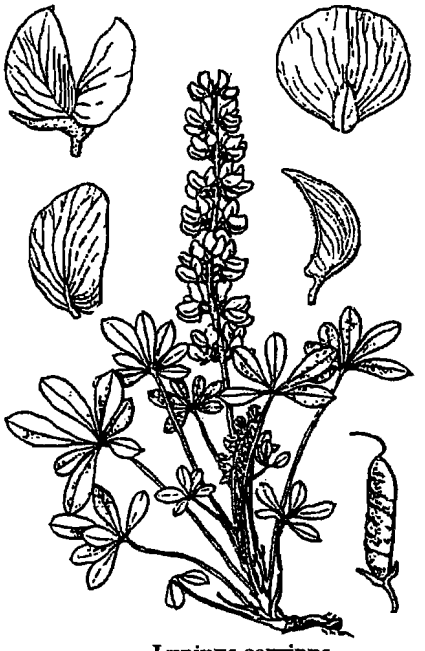


Lupinus albifrons abramsii

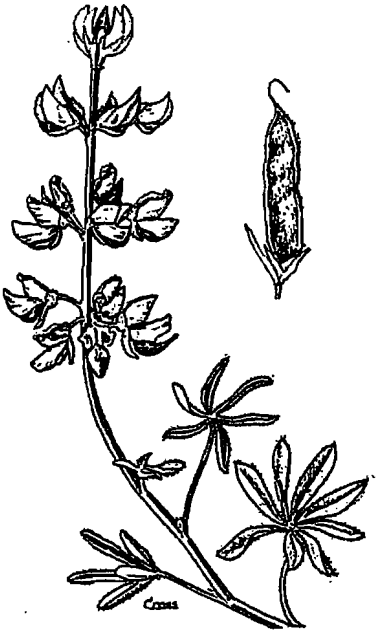


Lupinus bicolor

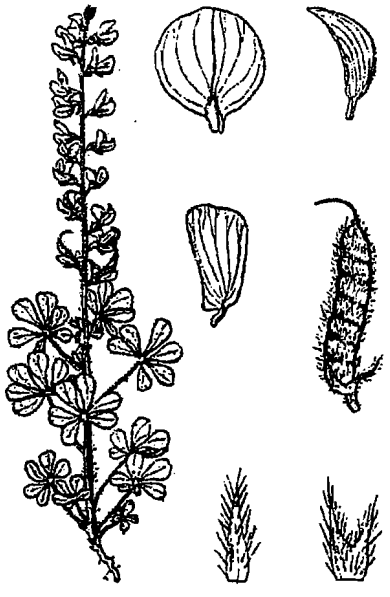
Lupinus concinnus



Lupinus cervinus



Lupinus formosus



Lupinus hirsutissimus

Lupinus microcarpus densiflorus

Lupinus nanus

California, from San Mateo County to northern Baja California. ⊛ April-May.

Lupinus microcarpus Sims var. **densiflorus** (Bentham) Jepson [*L. d.* Bentham]. WHITE-WHORL LUPINE, CHICK LUPINE, GULLY LUPINE (p 90). *HABIT*: simple or branched annual herbs ranging from about 2 to 4 dm. (8-16") tall. *LEAVES*: alternate and on petioles about 3 to 10 cm. long, the blades are palmately divided into 7 to 9 oblanceolate leaflets about 1 to 5 cm. long. *INFLORESCENCE*: the flowers are about 8 to 18 cm. long, and borne in dense and usually remote whorls on terminal spikes about 2 to 30 cm. long. *COROLLA*: the petals are mostly white, but often tinged with yellow and veined with violet or purple. *LEGUME*: ovoid, about 1.5 cm. long, and 2-seeded. *OCCURRENCE*: scattered in open and grassy areas along the Church Creek Fault (i.e., along the Horse Pasture and Church Creek Trails), and occasionally in other areas in this region, such as at the base of Flag Rock next to the parking lot at Tassajara Hot Springs. The plants are usually found in small colonies. *DISTRIBUTION*: Coast Ranges, from Humboldt Co. southward, and Sierra Nevada Foothills, from Placer Co. southward, to San Diego Co. ⊛April-June.

Lupinus nanus Douglas ex Bentham [*L. n.* subsp. *latifolius* (Bentham) D. Dunn, *L. vallicola* A. A. Heller, *L. v.* subsp. *apricus* (E. Green) D. Dunn]. SKY LUPINE (p 90). *HABIT*: pubescent annual herbs with a simple or branching stems ranging from about 1.5 to 6 dm. (6-24") tall. *LEAVES*: alternate and on petioles about 3 to 8 cm. long, the blades are palmately divided into 5 to 7 linear to broadly oblanceolate (or spatulate) leaflets about 1 to 3 cm. long. *INFLORESCENCE*: the flowers are about 8 to 15 mm. long, and borne in distinct whorls on conically-shaped terminal spikes about 3 to 20 cm. long. *COROLLA*: the petals are blue except for a white or pale yellow patch in the center of the banner. The spot turns rose-lavender after fertilization. *LEGUME*: about 2 to 4 cm. long and 4 to 8-seeded. *OCCURRENCE*: widespread and locally common to abundant in open and grassy habitats nearly throughout the Tassajara region. This is one of the showiest (and thus well-known) wildflowers in California, and is the lupine which, in most years, forms dense stands along the rock stairway to the hill cabins at Tassajara. *DISTRIBUTION*: from British Columbia southward, through the Sierra Foothills and Coast Ranges, to Los Angeles Co. *NOTE*: this is a variable species that has been subject to numerous taxonomic interpretations, and specimens referable to Tassajara Hot Springs collected by A. D. E. Elmer in June of 1901 (Elmer #3272 & 3298, DS) and Rimo Bacigalupi in April of 1933 (Bacigalupi #1115, DS) have been assigned to a number of taxa. Smith ('23) assigned one of Elmer's specimens (#3272) to *L. n. apricus*. Dunn ('55), who recognized this entity as *L. vallicola* subsp. *apricus*, assigned both of Elmer's specimens to typical *L. nanus*. Dunn assigned Bacigalupi's specimen to what he recognized as subsp. *latifolius* (distinguished by its more robust habit of growth, including larger leaflets, flowers and pods), and noted that plants indicating genetic interchange between subsp. *latifolius* and the typical species were to be found in the "vicinity of Tassajara Hot Springs." Bacigalupi's specimen was collected on "Tony's Boulevard grade above Tassajara Hot Springs" at about 2,200 ft. elevation, indicating that he collected it somewhere in the vicinity of The Pines. One of Elmer's specimens (#3298) was collected, according to a note enclosed in an envelope pasted to the sheet, in "Pine Valley across stream." I was not able to find Elmer's other specimen. ⊛March-June.

Lupinus stiversii Kellogg. HARLEQUIN LUPINE, ROSE AND YELLOW LUPINE (p 94). *HABIT*: simple or freely-branched annual herbs about 1 to 4.5 dm (4-18") tall. *LEAVES*: alternate and on petioles about 3 to 8 cm. long, the blades palmately divided into six to eight cuneate to obovate leaflets about 1 to 4 cm. long. *INFLORESCENCE*: the flowers are about 13 to 18 mm. long and borne in relatively short and densely to loosely-flowered terminal spikes. *COROLLA*: very distinctive, for the banner is yellow and the wings are rose-pink. *LEGUME*: about 2 to 2.5 cm. long and 5 to 7-seeded. *OCCURRENCE*: scattered in open and generally grassy areas on the higher ridges of the Tassajara region, such as along Tassajara Road above The Cascades (bathtub spring), and occasionally at lower elevations, such as in the Horse Pasture and along the Church Creek Trail between the Wind Caves and The Mesa. The plants are often found in small colonies. *DISTRIBUTION*: mostly in the Sierra Nevada between Butte Co. and Kern Co., with disjunct populations in the Santa Lucia Mts. and the higher mountains of southern California. ⊛April-May.

Lupinus succulentus Douglas ex Koch. ARROYO LUPINE, SUCCULENT LUPINE (p 94). *HABIT*: semi-succulent annual herbs with relatively stout and often hollow stems ranging from about 2 to 6 (or 10) dm. (8-24 -40") long. *LEAVES*: alternate and on petioles about 6 to 12 cm. long, the blades palmately divided into 7 to 9 oblanceolate leaflets about 2 to 7 cm. long. The leaflets are often semi-truncate at the apex. *INFLORESCENCE*: the flowers are about 12 to 18 mm. long, and borne in whorls on terminal spikes about 9 to 15 cm. long. *COROLLA*: the petals are deep purplish-blue to pinkish-lavender, and the banner has a white or yellow patch in the center. The patch turns reddish-lavender after fertilization. *LEGUME*: about 3.5 to 5 cm. long and 8 to 10 seeded. *OCCURRENCE*: rare in the Tassajara region, for only a few plants where found along the Church Creek Trail about ¼ of a mile south of The Mesa. The plants were growing in association with *Lupinus microcarpus densiflorus*. *DISTRIBUTION*: Coast Ranges, Central Valley and coastal southern California, from Shasta and Mendocino Counties to northern Baja California. ⊛March-May.

Lupinus truncatus Nuttall. WOOD LUPINE (p 94). *HABIT*: annual herbs ranging from about 3 to 10 dm. (12-40") tall. The plants typically have an erect primary stem and shorter and ascending lateral stems. *LEAVES*: alternate and on petioles about 5 to 10 cm. long, the blades palmately divided into five to seven linear leaflets about 1 to 4 cm. long. The leaflets are distinctly truncated (squared) and usually notched at the apex. *INFLORESCENCE*: the flowers are about 8 to 13 mm. long and rather spaciously arranged on elongated terminal spikes up to 25 cm. in length. *COROLLA*: the petals are mostly purplish-blue to purplish-red. *LEGUME*: about 3 cm. long and mostly 6 to 7-seeded. *OCCURRENCE*: widely scattered and fairly common at lower to inter-mediate elevations in the Tassajara region, primarily in open and grassy woodland habitats. *DISTRIBUTION*: outer Coast Ranges and more or less coastal slopes of the mountains of southern California, from Santa Cruz Co. to northern Baja California. ⊛April-May.

MEDICAGO. MEDICK, ALFALFA.

About 55 species of the northern temperate regions of the eastern hemisphere, and especially well represented in the Mediterranean region. Alfalfa is *M. sativa*.

1a. Pods one-seeded, more or less kidney-shaped, and not prickly or bur-like. Flowers borne in elongated, many-flowered spikes. . . . . ***M. lupulina.***

1b. Pods several-seed, spirally coiled, and with prickly-margins (and thus burr-like). Flowers borne in small clusters. . . . ***M. polymorpha.***

***Medicago lupulina** Linnaeus. BLACK MEDICK, NONESUCH, YELLOW TREFOIL (p 94). *HABIT*: annual herbs with prostrate or ascending stems ranging from about 1 to 4 dm. (4-16") long. *LEAVES*: alternate, generally remote, and divided into three obovate to roundish leaflets about 1 to 1.5 cm. long. *INFLORESCENCE*: the flowers are very small (about 1.5 to 2 mm. long) and clustered at the ends of axillary

peduncles about 1 to 2.5 cm. long. *Corolla*: the minute petals are yellow. *Legume*: black, slightly kidney-shaped and about 2 mm. long, and 1-seeded. *Occurrence*: found mostly in the lawns and gardens at Tassajara, but also scattered in places where garden refuse has been dumped, along trails, and in the streambed of Tassajara Creek below the hot springs. *Distribution*: a common weed in California; native to the Mediterranean region. ⊛April-July.

***Medicago polymorpha** Linnaeus [*M. hispida* Gaertner]. Bur-Clover (p 94). *Habit*: annual herbs with prostrate stems ranging from about 1 to 4 dm. (4-16") long. *Leaves*: alternate and on petioles about 1 to 4 cm. long, the blades divided into three obcordate leaflets about 8 to 20 mm. long. *Inflorescence*: the flowers are about 4 to 5 mm. long and produced in small clusters on axillary peduncles about .5 to 2.5 cm. long. *Corolla*: the petals are yellow. *Legume*: spirally coiled and about 4 to 6 mm. in diameter, and bur-like due to prickly-margins. *Occurrence*: found mostly in the lawns and gardens at Tassajara Hot Springs, but also scattered in places where garden refuse has been dumped, along trails, and in the streambed of Tassajara Creek downstream from the hot springs. *Distribution*: a common weed in California; native to the Mediterranean region. ⊛March-June.

MELILOTUS. Melilot, Sweet Clover.

About 20 species of the northern temperate regions of the eastern hemisphere, and especially well represented in the Mediterranean region.

***Melilotus alba** Medicus [*M. albus* Desrousseaux]. Sweet White Clover, White Melilot (p 94). *Habit*: annual or short-lived perennial herbs with generally erect stems ranging from about .6 to 2 m. (2-6') tall. *Leaves*: alternate and short-petiolate, and divided into three broadly to narrowly oblong-lanceolate leaflets about 1 to 2 cm. long. The margins are serrate. *Inflorescence*: the flowers are about 4 to 6 mm. long and borne in axillary and terminal spike-like racemes up to 10 cm. long. *Corolla*: white and about 4 to 5 mm. long. *Legume*: ovoid, about 3 to 5 mm. long, and 1 to 2 seeded. *Occurrence*: weedy in and around developed areas and scattered along or near the banks of Tassajara Creek, above and below the hot springs. In drought years the species has been abundant in the bed of Tassajara Creek for many miles downstream from the hot springs. *Distribution*: a very common weed in California; native to Eurasia. *Note*: the yellow flowered *M. indicus* is often weedy in and about the gardens at Tassajara Hot Springs, but has not been seen outside this specialized habitat. ⊛April-Sept.

RUPERTIA. Scurf Pea.

Three species of western North America. All of the species occur in California, and two are endemic to the California Floristic Province. Segregated from *Psoralea*.

Rupertia physodes (Hooker) Grimes [*Psoralea p.* Douglas]. California Tea (p 94). *Habit*: perennial herbs with erect or ascending stems ranging from about 3 to 7 dm. (12-28") tall. Plants are typically found in what appear to be colonies, but such groups are largely produced by creeping rhizomes. *Leaves*: alternate and on petioles about 2 to 5 cm. long, the blades divided into 3 ovate to orbicular entire-margined leaflets about 2 to 6 cm. long. *Inflorescence*: the flowers are produced in clustered axillary racemes. *Corolla*: about 10 to 12 mm. long; the petals are pale greenish-white. *Legume*: small (about 6 mm. long), suborbicular and compressed, and 1-seeded. *Occurrence*: this species is known to occur in only three localities in this region: in shady woodland habitats along the Marble Peak Trail, from near the Horse Bridge to Tassajara Camp, scattered in chaparral along the Horse Pasture Trail in the Blackberry Creek area, and along the Pine Ridge Trail, a short distance west of the first summit west of China Camp. *Distribution*: from British Columbia and Idaho southward, through the Coast Ranges, to the mountains of southern California. ⊛April-June.

THERMOPSIS.

About 10 species of North America and Asia.

Thermopsis macrophylla Hooker & Arnott. Golden Pea, False Lupine (p 94). *Habit*: perennial herbs with relatively stout stems ranging from about .3 to 1.5 m. (1-5') tall. The stems wither away in winter, and new stems are produced in the spring. *Leaves*: alternate and on petioles about 2 to 3 cm. long, the blades divided into three obovate to oblanceolate leaflets about 4 to 6 cm. long. The leaves are subtended by two large leaflet-like stipules about 2 to 3 cm. long. *Inflorescence*: the showy flowers are about 17 to 19 mm. long and borne in terminal racemose spikes about 1 to 5 dm. long. *Corolla*: the petals are bright yellow. *Legume*: about 6 to 8 cm. long and few to many-seeded. *Occurrence*: scattered around the Church Creek Divide and locally common in Pine Valley and on Pine Ridge. *Distribution*: outer Coast Ranges, from southwestern Oregon to Ventura Co. ⊛May-June.

TRIFOLIUM. Clover.

A well known genus with anywhere from between 150 and 300 species (the figures vary considerably). Most of the species are restricted to northern temperate regions of North America and Eurasia, but some occur in South America and Africa.

1a. Flower-heads not subtended by disk or collar-like involucres:
2a. Flower borne on short pedicels and turning outward or downward with age. Calyces with cilia (stiff hairs) on margins. . . ***T. ciliolatum***.
2b. Flowers nearly sessile and tightly compacted in the head, and not turning outward or downward with age. Calyces densely hairy throughout. . . . . ***T. albopurpureum***.
1b. Flower-heads subtended by disk or collar-like involucres:
3a. Involucres bowl-shaped and with 7-10 toothless marginal lobes. Flower-heads less than 9 mm. wide. . . . . ***T. microcephalum***.
3b. Involucres more or less flat and with sharply toothed margins. Flower-heads more than 9 mm. wide:
4a. Involucres deeply lobed. . . . . ***T. variegatum***.
4b. Involucres shallowly if at all lobed:
5a. Wings reddish-purple, banners pale. Common in open, grassy areas. . . . . ***T. willdenovii***.
5b. All petals pale, banner with a dark spot. Found only in wet or moist habitats. . . . . ***T. obtusiflorum***.

Trifolium albopurpureum Torrey & Gray. RANCHERIA CLOVER, WHITE AND PURPLE CLOVER (p 94). *HABIT*: small villous-pubescent annual herbs with trailing or ascending stems ranging from about 1 to 4 dm. (4-16") long. *LEAVES*: alternate and on petioles about .5 to 4 cm. long, the blades divided into 3 obovate to cuneate-oblong and obtuse leaflets about 6 to 18 mm. long. The margins are finely toothed toward the apex. *INFLORESCENCE*: flowers are very small and borne in pubescent heads about 8 to 15 mm. long. *COROLLA*: about 6 to 7 mm. long and barely exceeding the lobes of the calyx. The petals are purple and white. *LEGUME*: 1-seeded. *OCCURRENCE*: widely scattered and locally common in open and generally grassy habitats in the Tassajara region. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California. ⊛March-June.

Trifolium ciliolatum Bentham [*T. ciliatum* Nuttall]. TREE CLOVER (p 95). *HABIT*: annual herbs typically with erect or ascending stems ranging from about 2 to 5 dm. (8-20") tall. *LEAVES*: alternate and on petioles up to 15 cm. long, the blades divided into 3 obovate to oblanceolate leaflets about 1 to 3 cm. long. The leaflets are generally obtuse to truncate at the apex (some-times notched), and the margins are serrate to entire. *INFLORESCENCE*: the flowers are borne in heads which are at first ovoid in shape and about 7 to 20 mm. wide. The flowers soon become more or less deflexed on pedicels up to 6 mm. long. *COROLLA*: about 6 or 7 mm. long; the petals are mostly pink to purplish. *LEGUME*: 1 or 2 seeded. *OCCURRENCE*: widely scattered and locally common in open grassy habitats in the Tassajara region. *DISTRIBUTION*: Pacific Slope, from Washington to northern Baja California. ⊛March-June.

Trifolium microcephalum Pursh. MAIDEN CLOVER, SMALL-HEADED CLOVER (p 95). *HABIT*: annual herbs with mostly decumbent or ascending stems ranging from about 2 to 4 dm. (8-16") long. *LEAVES*: alternate and divided into 3 obcordate to oblanceolate leaflets about .8 to 2 cm. long. The leaflets are generally rounded and often notched at the apex, and the margins are serrate. *INFLORESCENCE*: the flower heads are fairly small (about 5 to 8 mm. wide), subtended by bowl-shape involucres, and borne on peduncles about 3 to 7 cm. long. *COROLLA*: about 4 to 7 mm. long; the petals are pink or pinkish. *LEGUME*: 1 or 2-seeded. *OCCURRENCE*: widespread and locally common in more or less open and grassy habitats in the Tassajara region. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California. ⊛April-June.

Trifolium obtusiflorum Hooker. CLAMMY CREEK CLOVER (p 95). *HABIT*: annual herbs with generally ascending stems ranging from about 3 to 5 dm. (12-20") long. *LEAVES*: alternate, subtended by finely-bristly margined stipules, and divided into three obovate to oblanceolate and serrately margined leaflets about .5 to 3 cm. long. *INFLORESCENCE*: the flowers are borne in relatively large heads (up to 16 mm. wide) on peduncles about 2 to 8 cm. long. *COROLLA*: about 12 to 14 mm. long; the petals are pale-hued to nearly white, and the banner has a conspicuous dark purplish-gray spot. *LEGUME*: 2-seeded. *OCCURRENCE*: lightly scattered along perennial (or sometimes seasonal) streams in the Tassajara region. *DISTRIBUTION*: from southwestern Oregon, through the Coast Ranges and Sierra Nevada, to the mountains of southern California. ⊛April-July.

Trifolium variegatum Nuttall. WHITE-TIPPED CLOVER (p 95). *HABIT*: annual herbs with trailing or ascending stems ranging from about 1 to 6 dm. (4-24") long. *LEAVES*: alternate, subtended by laciniately toothed stipules, and divided into 3 obovate to oblong-oblanceolate leaflets about .5 to 1.5 cm. long. The margins are serrate. *INFLORESCENCE*: peduncles are about 1 to 8 cm. long, and the heads range from about 1 to 1.5 cm. wide. *COROLLA*: about 5 to 8 mm. long; the petals are at first dark purple, but fade pinkish with age, and the banner is white-tipped at the apex. *LEGUME*: 1 or 2-seeded. *OCCURRENCE*: widely scattered in moist or seasonally moist habitats in the Tassajara region, but uncommon. *DISTRIBUTION*: Pacific Slope, from British Columbia to northern Baja California, and eastward to Montana, Colorado and Arizona. *NOTE*: this is a highly variable species which Isely (in Hickman, ed., '93) has divided into 5 phases. The closely observed local plants seem to best fit the description of the typical species (i.e., phase 1). ⊛April-July.

Trifolium willdenovii Sprengel [*T. tridentatum* Lindley]. TOMCAT CLOVER (p 95). *HABIT*: annual herbs with erect to ascending (or sometimes trailing) stems ranging from about 1 to 6 dm. (4-24") long. *LEAVES*: alternate, the petioles are about .5 to 5 cm. long, and the blades are divided into 3 linear to narrowly lance-oblong leaflets about 1 to 5 cm. long. The margins of the leaflets are toothed. *INFLORESCENCE*: the flowers are borne in relatively lax heads about 1 to 3 cm. wide. The peduncles are about 3 to 9 cm. long. *COROLLA*: about 8 to 15 mm. long; the petals are reddish-purple, and the banner fades to nearly white toward the apex. *LEGUME*: usually 2-seeded. *OCCURRENCE*: widespread and common in the Tassajara region, primarily in open and grassy habitats. *DISTRIBUTION*: from British Columbia and Idaho to northern Baja California and New Mexico. Also reported from South America. ⊛March-June.

VICIA. VETCH, TARE.

About 130 species of the temperate regions of the northern hemisphere and South America.

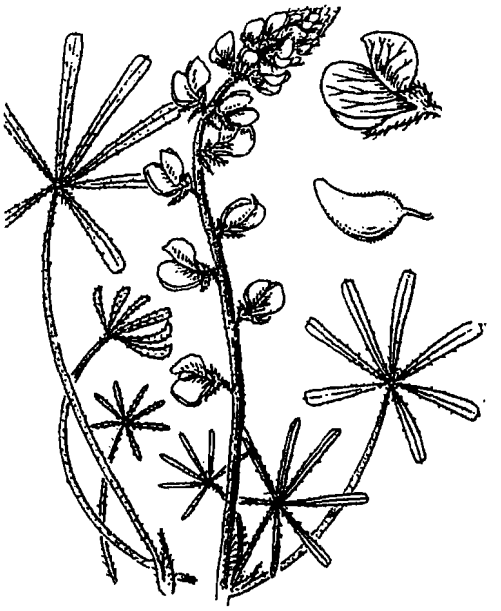
1a. Flowers borne in few to many-flowered axillary racemes. . . . . ***V. americana.***
1b. Flowers borne singularly (or in two's) in the axils of the leaves. . . . . ***V. sativa.***

Vicia americana Willdenow [*V. a.* Muhlenberg subsp. *oregana* (Nuttall) Abrams, *V. a.* subsp. *o.* var. *linearis* Watson & var. *truncata* (Nuttall) Brewer]. AMERICAN VETCH (p 95). *HABIT*: perennial vines with sprawling branches ranging from about 6 to 12 dm. (2-4') or more in length. The branches climb on other plants by means of coiling tendrils. *LEAVES*: alternate and pinnately divided into 8 to 16 leaflets ranging from about 1 to 3.5 cm. long. The leaflets vary considerably in size and shape from plant to plant, from (most commonly) fairly broadly ovate-elliptical to narrowly linear-lanceolate (var. *linearis* type plants) or short with an abruptly truncated apex (var. *truncata* type plants). *INFLORESCENCE*: axillary racemes comprised of 3 to 10 flowers which tend to spaciously arranged on one side of the axis. *COROLLA*: about 1.5 to 2.5 cm. long; the petals are at first purple or purplish, but tend to turn bluish with age. *LEGUME*: about 2.5 to 3 cm. long and containing several seeds that are about 4 mm. wide. *OCCURRENCE*: widely scattered in open and grassy woodland habitats in the Tassajara region, but much less common than the very similar appearing *Lathyrus vestitus*. *DISTRIBUTION*: widespread in temperate North America. Along the Pacific Slope the species ranges from Idaho and British Columbia to southern California. ⊛April-June.

***Vicia sativa** Linnaeus. COMMON VETCH, SPRING VETCH, TARE (p 95). *HABIT*: annual vines with trailing or climbing stems ranging from about 3 to 9 dm. (1-3') long. *LEAVES*: alternate and pinnately divided into 8 to 16 oblong to cuneate leaflets about 1.5 to 3.5 cm. long. The leaflets are mostly truncate and notched at the apex. *INFLORESCENCE*: flowers are nearly sessile and produced singularly or in 2's in the axils of the leaves. *COROLLA*: about 1.8 to 3 cm. long, the petals vary from pink-purple to a dull blackish-purple. *LEGUME*: about 2.5 to 6 cm. long; the seeds are about 5 mm. wide. *OCCURRENCE*: scattered in grassy areas in the vicinity of Tassajara Hot Springs and in the Horse Pasture, and occasionally along Tassajara Road and some trails. *DISTRIBUTION*: a common weed in North America, native to Europe. ⊛April-July.

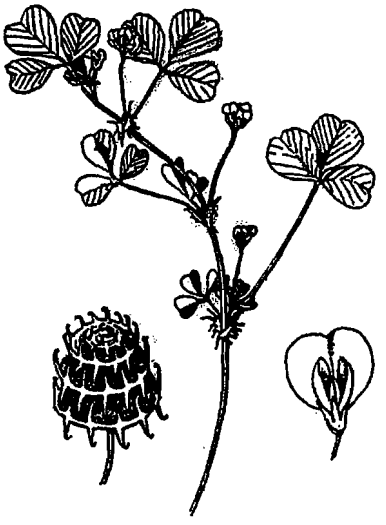
Lupinus *stiversii*

Lupinus succulentus



Lupinus truncatus

Medicago lupulina



Medicago polymorpha

Melilotus alba

Rupertia physodes

Thermopsis macrophylla

Trifolium albopurpureum

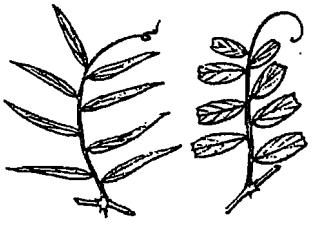
Trifolium ciliolatum

Trifolium microcephallum

Trifolium obtusiflorum

Trifolium variegatum

Trifolium wildenovii



Vicia americana

Vicia sativa

Notes on *Fabaceae*.

The listing of Tassajara Springs as a Monterey County site for *Amorpha californica* by Howitt and Howell ('64) was based on one of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June 1901 (Elmer #3280 CAS). According to a note enclosed in an envelope pasted to the sheet, Mr. Elmer collected the specimen "near Jamesburg."

Trifolium species to occur in the Santa Lucia Mts. near or relatively near to the Tassajara region include *Trifolium depauperatum* var. *amplectens*, *Trifolium gracilentum*, and *Trifolium oliganthum*.

FAGACEAE. BEECH OR OAK FAMILY.

Seven genera and about 900 species of chiefly northern-temperate trees and shrubs. The family includes *Quercus* (oak), *Fagus* (beech), *Nothofagus* (beeches of the southern hemisphere), *Castenea* (chestnut), *Chrysolepis* (chinquapin), and *Lithocarpus* (tan oak).

1a. Catkins relatively stiff, more or less erect (from the point of attachment), and containing both staminate and pistillate flowers (the staminate flowers positioned above the pistillate flowers). Scales of acorn cups slender and spreading. . . . . ***Lithocarpus***.
1b. Catkins limber, dangling, and staminate (pistillate flowers are borne in axillary clusters). Scales of acorn cups thick and appressed. . . . ***Quercus***.

LITHOCARPUS. TAN OAK, TANBARK OAK.

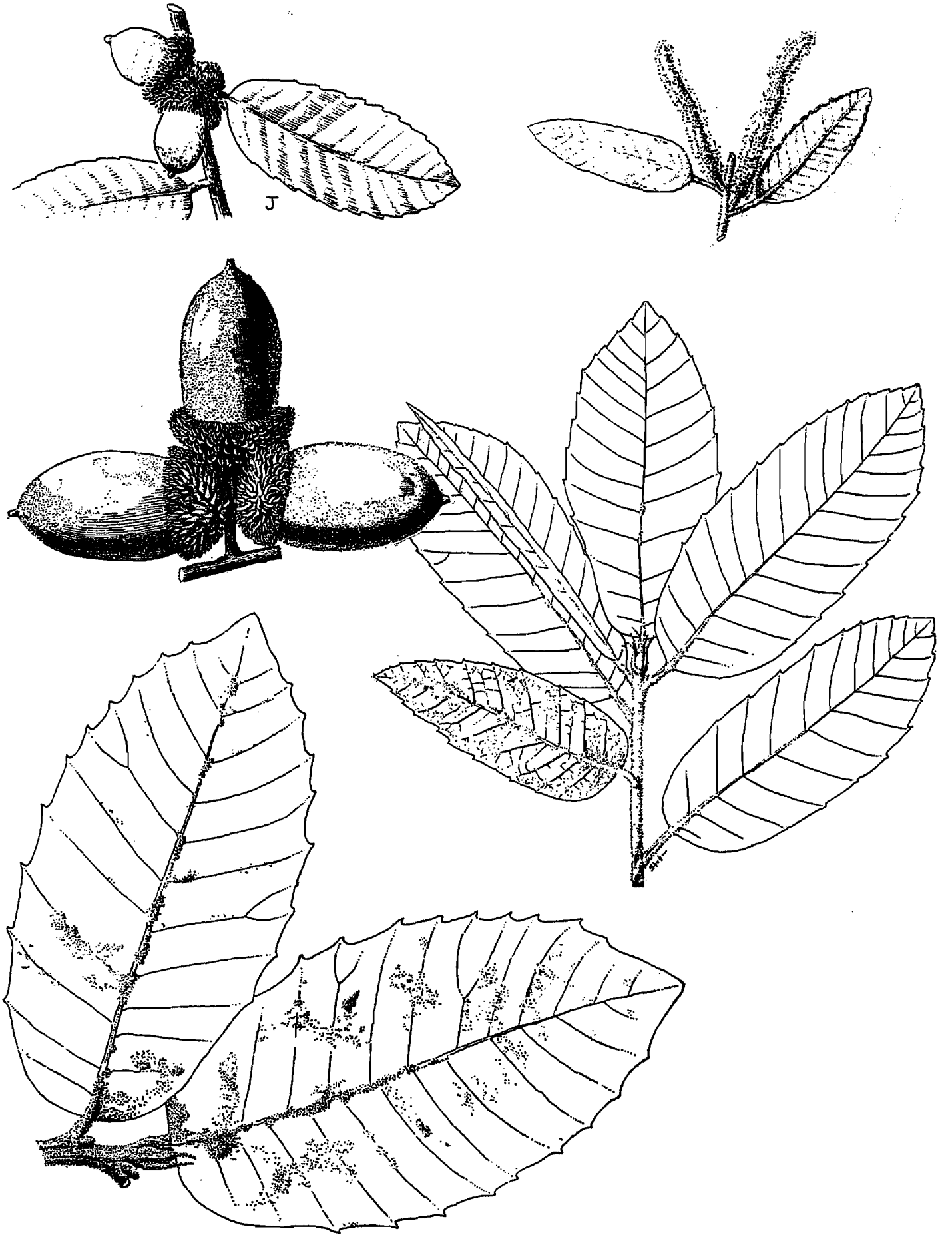
About 100 species of southeast and east Asia, and one of the Pacific slope of western temperate North America.

Lithocarpus densiflorus (Hooker & Arnott) Rehder [*Quercus d.* H. & A.] (p 97). *HABIT*: evergreen trees typically with narrow-conical shaped crowns ranging from about 12 to 30 (45) m. (40-98' [150']) tall, or sometimes shrubs less than 3 m. (10') tall in chaparral habitats. *BARK*: thick and fissured. *LEAVES*: alternate, the petioles about 1 to 2.5 cm. long, the blades oblong to oblong-ovate, about 4 to 12 cm. long, and the margins are with serrate teeth terminating pronounced and generally evenly-spaced lateral veins. *INFLORESCENCE*: fairly stiff catkins containing both staminate and pistillate flowers. Staminate flowers are located above the pistillate flowers. *FRUIT*: large and generally ovoid acorns about 2.5 to 3.5 cm. long. The cups are covered with relatively slender and spreading scales. *OCCURRENCE*: locally common to abundant in mixed evergreen forests at higher elevations in the Tassajara region, and forming a nearly pure stand along the first half mile or so along the Pine Ridge Trail west of Tassajara Road. Scattered groves also occur in the upper watershed of Oryoki Creek, and near to the hot springs a small grove is established along Tony's Trail, near the summit on the hot springs side of the grade. A shrub form is common in chaparral along the Black Cone Trail south of South Ventana Cone (and according to Vern Yadon, extending over the summit of the Elephant's Back), and lightly scattered in chaparral on summit of Black Butte Ridge. *DISTRIBUTION*: outer Coast Ranges and western Transverse Ranges, from southwestern Oregon to the Santa Ynez Mts. of Santa Barbara Co. and western Ventura Co., with scattered populations in the Sierra Nevada from Mariposa Co. northward. *NOTE*: perhaps the shrub-like plants in this region should be assigned to var. *echinoides*, for they are reproductively fully mature (even though they are mostly less than 3 m. tall), and the leaves are mostly without prominent teeth terminating the veins. The plants, however, seem not to have a distinct line of separation between the shrub and tree varieties of this species, for plants growing in gulches or on northfacing slopes in areas immediately adjacent to populations of shrub-like plants tend to be much taller, and the leaves are mostly with prominent teeth. Variety *echinoides* is scattered in the north Coast Ranges in Del Norte and Humboldt Counties, and from Shasta to Mariposa Counties in the Sierra Nevada. ⊕June-Oct.

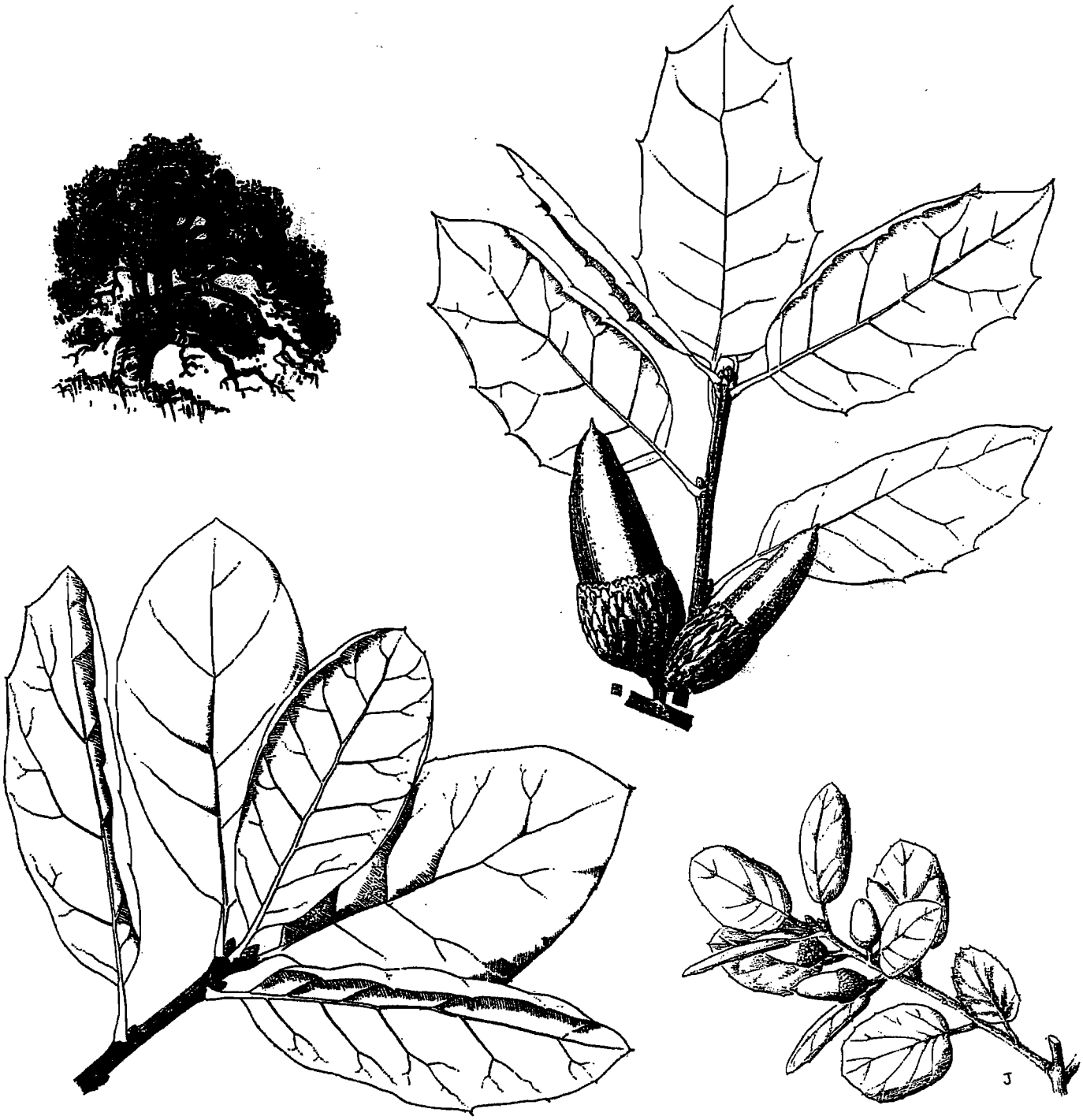
QUERCUS. OAK.

About 600 species of trees and shrubs primarily of the temperate regions of the northern hemisphere, but with some species extending southward into tropical regions, such as in northern South America and India. In much of California oaks represent one of the most common and conspicuous elements of the natural landscape. Nineteen species occur within the boundaries of the state (not including numerous lesser taxa and hybrids), and 14 species are endemic to the California Floristic Province. At least six species are present in the Tassajara region.

1a. Evergreen trees or shrubs ("live oaks"). Leaves rather stiff, the margins ranging from coarsely toothed to entire, but not with distinct lobes:
2a. Bark rough and broken into numerous small segments. Leaves green or grayish-green and shiny above, but distinctly pale or dull yellowish or grayish below. Inner surface of acorn shell not hairy. . . . . ***Q. chrysolepis***.
2b. Bark relatively smooth and becoming fissured into broad plates with age. Leaves deep green and shiny on both surfaces, with little or no variation in color. Inner surface of acorn shell hairy:
3a. Trees (if growing within chaparral, then standing well above associating shrubs). Leaves mostly convex (like a spoon turned upside down); the lower surfaces usually with tufts of hairs scattered on the major veins. Acorns narrowly lanceolate in outline, and maturing in one year. . . . . ***Q. agrifolia***.
3b. Shrubs. Leaves flat or nearly flat; the lower surfaces without tufts of hair. Acorns oblong in outline, and maturing in two years. . . . . ***Q. wislizenii***.
1b. Deciduous trees. Leaves limber to stiff, and deeply to shallowly lobed (or sometimes entire in *Q. douglasii*):
4a. Leaves blue-green or bluish gray-green; the margins shallowly lobed or sometimes entire. . . . . ***Q. douglasii***.
4b. Leaves not bluish-hued; the margins deeply lobed:
5a. Lobe margins with sharp teeth terminating in limber spines. Bark dark-colored. Inner surface of acorn shell hairy. . . . . ***Q. kelloggii***.
5b. Lobe margins entire or with rounded and spineless teeth. Bark with a whitish cast. Inner surface of acorn shell not hairy. . . ***Q. lobata***.

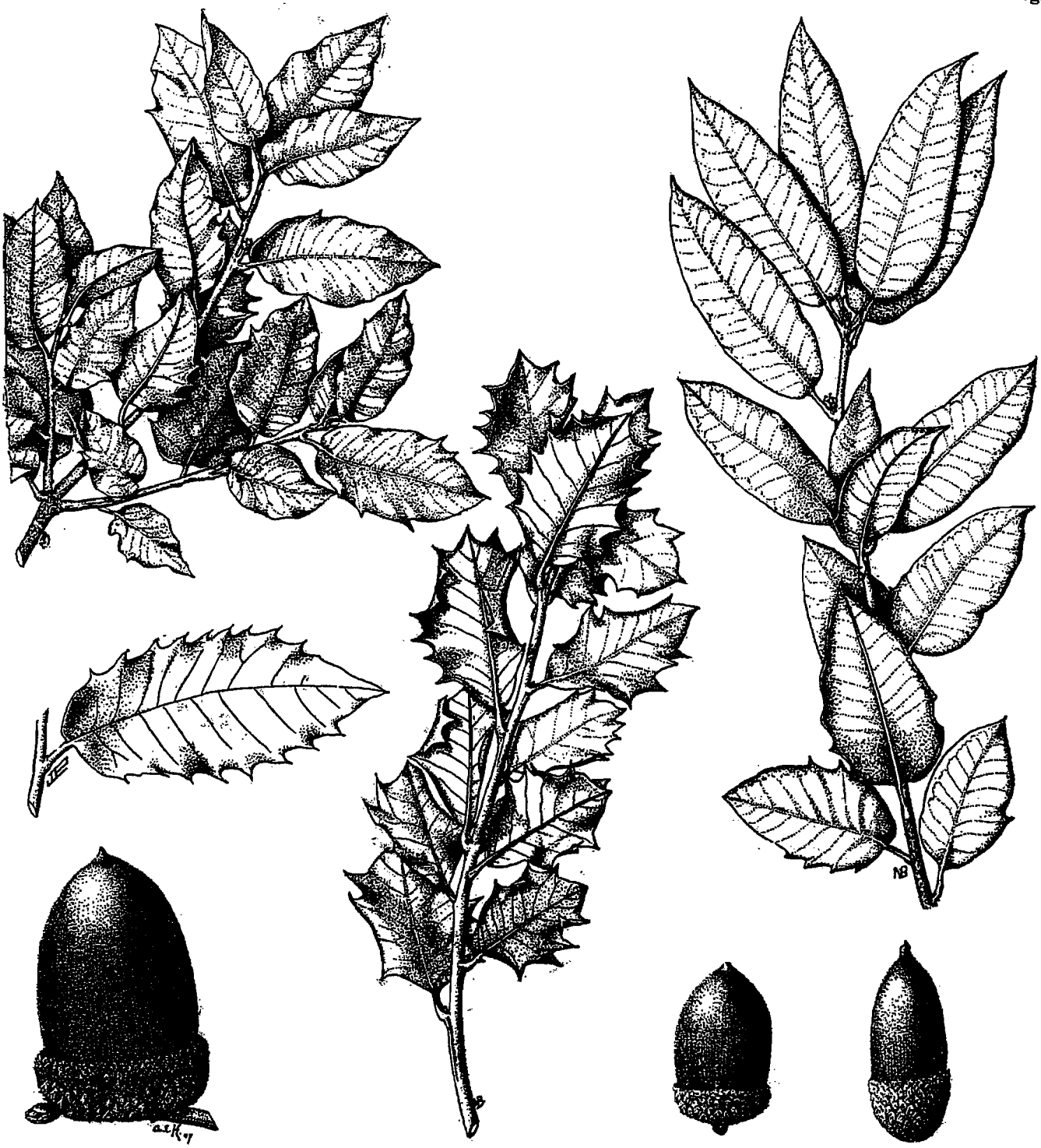


Lithocarpus densiflorus



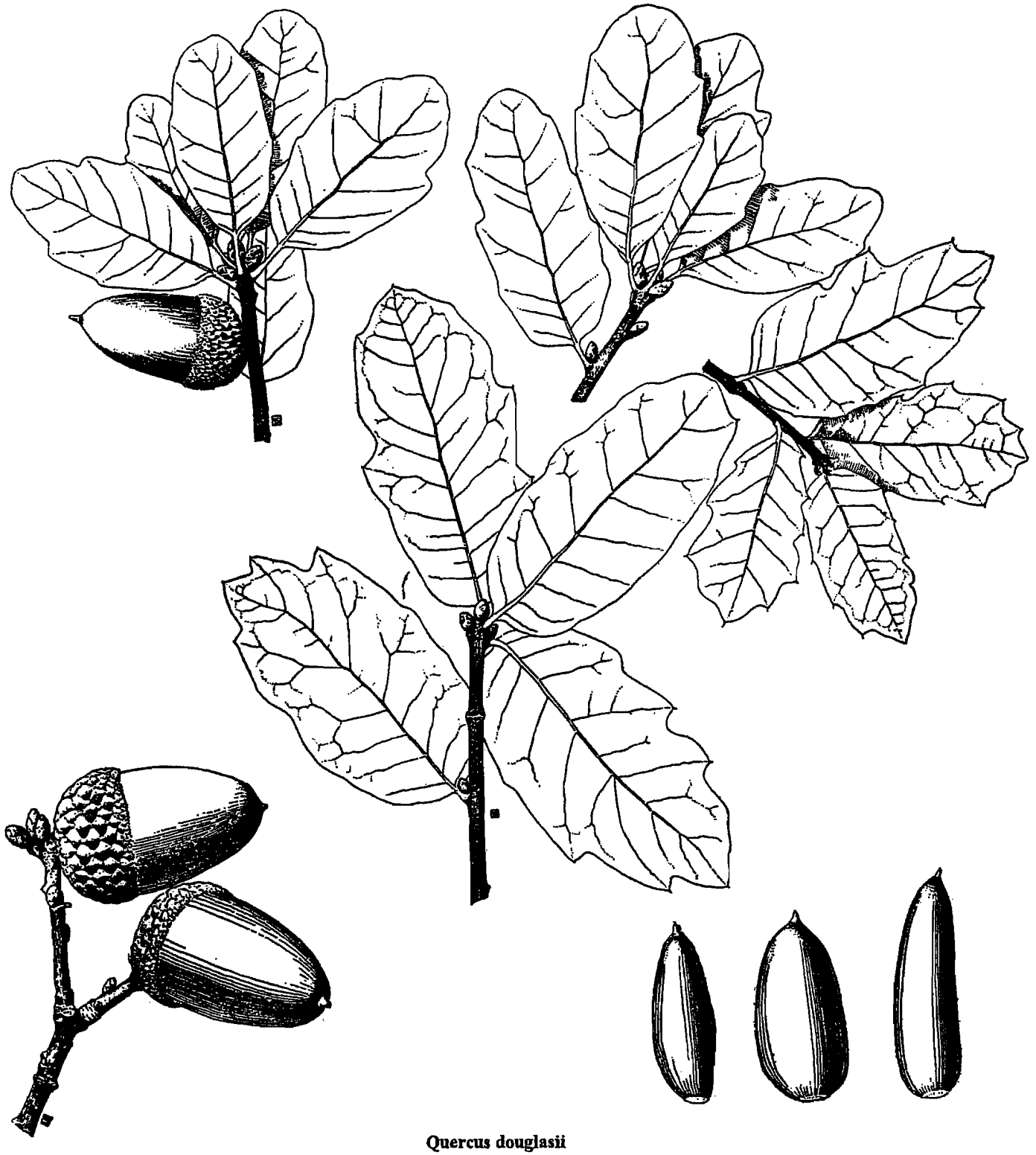
Quercus agrifolia

Quercus agrifolia Nee. COAST LIVE OAK, CALIFORNIA LIVE OAK, ENCINA (p 98). *HABIT*: evergreen trees typically with broad and rounded crowns ranging (in maturity) from about 8 to 23 m. (25-75') tall. The trunks are rather stout (the girth of unusually large trees can sometimes exceed 3 m. [10'] in diameter), and the branches, which can be massive, often exhibit a tortuous habit of growth. *BARK*: thick, moist, and deeply fissured into broad plates. *LEAVES*: alternate, the petioles are about 4 to 15 mm. long, while the blades are about 2 to 7 cm. long, usually convex (like a spoon turned upside down), roundish to ovate or oblong (or sometimes elliptic), and with ~~small spine-like teeth terminating the major veins~~. ~~*INFLORESCENCE*~~: staminate flowers are produced in dangling catkins about 3 to 6 cm. long, while the pistillate flowers are borne in small axillary clusters. *ACORN*: about 2.5 to 3.5 cm. long, narrowly lanceolate in outline, and tapering to a rather sharp point. *OCCURRENCE*: very common in woodland habitats at lower to intermediate elevations in the Tassajara region (where it is perhaps the most abundant of all tree species), but uncommon above about 3,000 ft., and nearly absent above about 3,500 feet. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges (rarely more than 50 miles from the coast), from Mendocino Co. to the western slopes of Mt. San Pedro Matir in northern Baja California. This is the most abundant tree species in ~~the coastal~~ counties of ~~California~~ from the northern San Francisco Bay Area and southward. ⊛March-April.



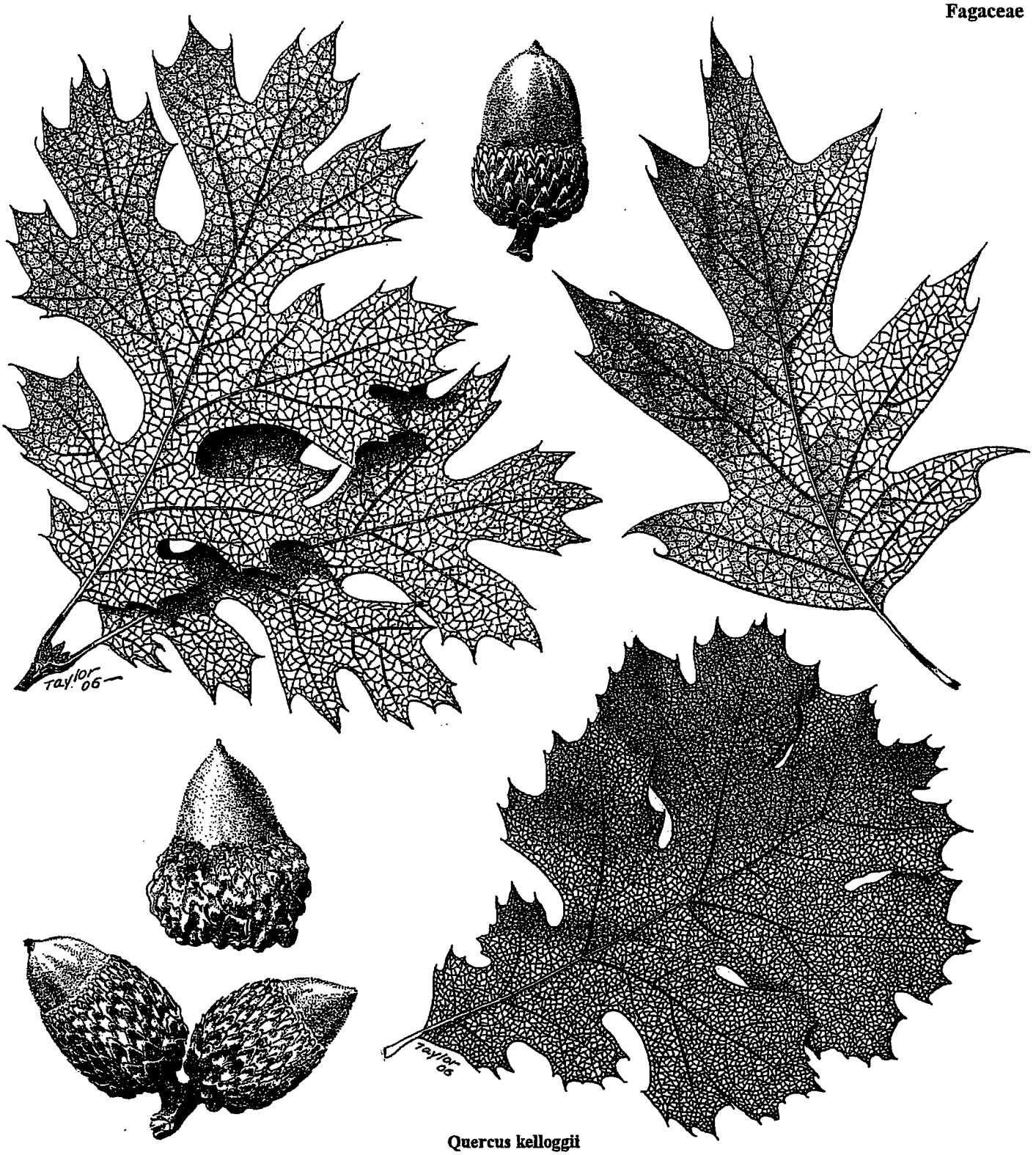
Quercus chrysolepis

Quercus chrysolepis Liebmann. CANYON LIVE OAK, VALAPARAISO OAK, MAUL OAK, IRON OAK, GOLDEN CUP OAK (p 99). *HABIT*: evergreen oaks ranging from open-crowned trees about 7.5 to 22 m. (25-70') tall in forest and woodland habitats, to medium or large sized shrubs in chaparral. The trunks of exceptionally large trees can exceed 3 m. (10') in diameter, and the primary branches of such plants can be quite massive. *BARK*: relatively thin and roughly fissured. *LEAVES*: alternate and on petioles about 3 to 10 mm. long, the blades about 2 to 6 cm. long, ovate to lanceolate or oblong, and with extremely variable margins, ranging from flat and entire to wavy and densely spiny toothed. The lower surfaces of the blades have a distinctive powdery or felt-like coating that is at first yellowish but becomes dull and grayish with age. *INFLORESCENCE*: staminate flowers are borne in dangling catkins, while the pistillate flowers are produced in small axillary clusters. *ACORN*: varying from broadly ovate or obovate to oblong in outline, and from 2 to 3.75 cm. long. *OCCURRENCE*: common to abundant at all elevations in the Tassajara region, both as a tree in woodlands or as a shrub in chaparral, and forming nearly pure stands (as trees) in many areas, especially at higher elevations. *DISTRIBUTION*: Cascade, Sierra Nevada, Coast, Transverse and Peninsular Ranges, from western Oregon to northern Baja California, and in mountainous areas as far east as New Mexico. ⊛April-May.



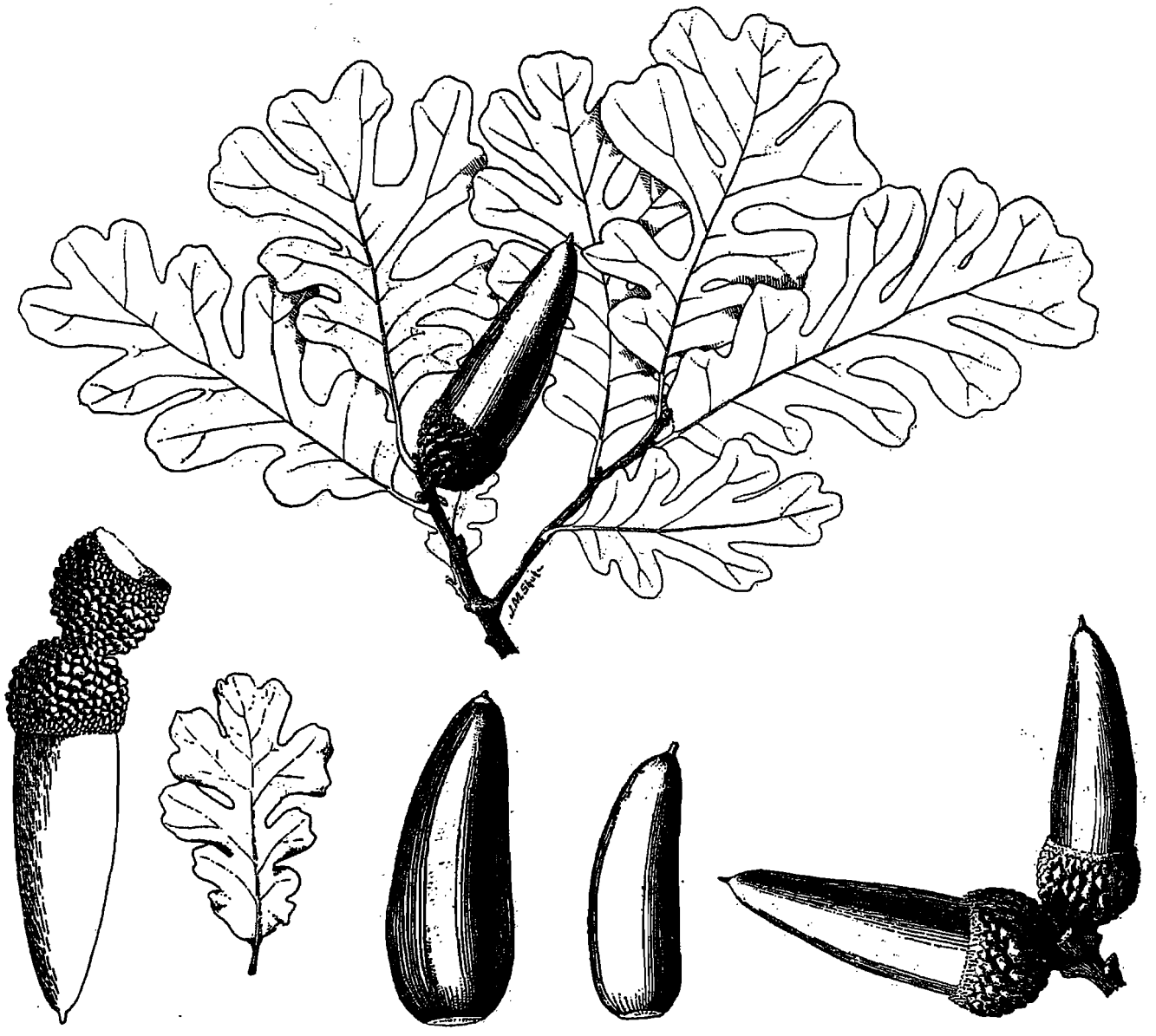
Quercus douglasii

Quercus douglasii Hooker & Arnott. BLUE OAK (p 100). *HABIT*: deciduous white oaks ranging from about 6 to 19 m. (20-60') tall. *BARK*: fissured into a checker-like pattern, with the outer-most surfaces typically exhibiting a light gray cast. *LEAVES*: alternate and with petioles about 3 to 9 mm. long, the blades blue or bluish-green or gray-green, about 3 to 10 cm. long, generally oblong, and with entire or irregularly lobed margins. *INFLORESCENCE*: staminate flowers are produced in dangling catkins, while pistillate flowers are borne in small axillary clusters. *ACORN*: varying from broadly ovate to oblong in outline, and ranging from about 2 to 3 cm. long. *OCCURRENCE*: locally common in open oak-woodlands in the Arroyo Seco area, and extending westward to about the confluence of the Willow Creek and Tassajara Creek, and northwestward along the Horse Pasture Trail to the vicinity of Quail Spring. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills and western Transverse Ranges, from Shasta and Siskiyou Counties to Santa Barbara Co. and northwestern Los Angeles Co. Also on Santa Cruz and Santa Catalina Islands. ⊛ April-May.



Quercus kelloggii

Quercus kelloggii Newberry. CALIFORNIA BLACK OAK (p 101). *HABIT*: deciduous trees typically with open and rounded crowns ranging from about 10 to 25 m. (33-82') tall. *BARK*: dark-hued and fissured into small plates. *LEAVES*: alternate, the petioles are about 1 to 4 cm. long, while the blades are about 9 to 20 cm. long, broadly obovate to ovate in outline, and deeply cleft into two or three pairs of lobes, the margins of which bear sharply-acute teeth at the ends of the primary and secondary veins. *INFLORESCENCE*: staminate flowers are produced in dangling catkins about 3.5 to 7.5 cm. long, while the pistillate flowers are borne in small axillary clusters. *ACORN*: generally broadly ovate in outline and about 2.5 to 3 cm. long. As the acorns take two years to mature, partially developed acorns are usually present on most trees. *OCCURRENCE*: common in and around Pine Valley, and extending southwestward to Bear Basin and southeastward to the upper regions of Church Creek (to near The Caves). Also scattered in the Strawberry Valley area, and abundant along Tassajara Road between White Oaks Camp and Jamesburg. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southwestern Oregon to the mountains of northern Baja California, and occurring mostly in mixed evergreen forests between 1,000 to 8,000 ft. elevation. ⊛April-May.



Quercus lobata

Quercus lobata Nee. VALLEY OAK, CALIFORNIA WHITE OAK, ROBLE (p 102). *HABIT*: deciduous white-oaks typically with broad and rounded crowns ranging from about 12 to 30+ m. (40-100+') tall. The trunks can be quite massive, and the branches frequently have a tortuous habit of growth. *BARK*: deeply fissured into a checker-like pattern of thick segments, the outer surfaces of which are with a whitish cast. *LEAVES*: alternate and with petioles about 5 to 12 mm. long, the blades about 5 to 12 cm. long, oblong to obovate in outline, and pinnately divided (sometimes irregularly so) into 5 to 11 lobes that are rounded to irregularly undulate at the apex. *INFLORESCENCE*: staminate flowers are borne in limber and dangling catkins, while the pistillate flowers are produced in axillary clusters. *ACORN*: lanceolate in outline and about 3 to 5 cm. long. *OCCURRENCE*: locally common in the Tassajara region, but mostly restricted to deep-soiled areas along fault zones. Along the Willow Creek Fault the species is common from the confluence of Tassajara Creek and the Arroyo Seco River to about ¼ of a linear mile west of Willow Springs Camp, and along the Church Creek Fault the species is common from the junction of Willow Creek Fault (in the vicinity of the junction of the Horse Pasture and Marble Peak Trails) to the Horse Pasture. After a gap from The Pines to the Wind Caves, the species is once again common in the Church Creek area, from just north of the Wind Caves and extending northwestward towards the Church Creek Divide. The species is also common on Chew's Ridge, from China Camp northward, and near the hot springs a small community is established on the small ridge to the south-southeast the developed area. The Chew's Ridge population is notable for its exceptionally high elevation, and most of the larger plants exhibit the consequences of being subjected to heavy snowfalls. Such plants have large trunks but few or no major branches. *DISTRIBUTION*: Sierra Nevada Foothills, Coast Ranges and western Transverse Ranges, from Shasta Co. and northern Mendocino Co. to western Los Angeles Co., and in the Sacramento and northern San Joaquin Valleys, where now mostly restricted to river banks. Also on Santa Cruz and Santa Catalina Islands. *NOTE*: this species is said to be the largest of all North American oaks, and the crowns of exceptionally large trees can exceed both 37 m. (120') high and wide, and with trunks up to 3.7 m. (12') in diameter. Fortunate trees can live for more than 1,000 years. Habitats in which this species is dominant tend to be open, grassy, and dotted with large and fairly evenly spaciously placed trees. ⊕March-April.

Quercus wislizenii deCandolle var. **frutescens** Englemann. INTERIOR LIVE OAK, SIERRA LIVE OAK (p 106). *HABIT*: evergreen shrubs usually with rounded crowns ranging from about 2 to 4 m. (6-12') tall. *BARK*: relatively smooth but becoming deeply fissured with age. *LEAVES*: alternate and with petioles about 3 to 10 mm. long, the blades about 2 to 4 cm. long, lanceolate to nearly roundish, shiny green on both surfaces, and with flat and spiny-toothed margins (although the leaves of this species often have entire margins, this trait was not observed in any of the local plants). *INFLORESCENCE*: staminate flowers are produced in limber dangling catkins, while pistillate flowers are produced in axillary clusters. *ACORN*: oblong to lanceolate in outline, about 2 to 4 cm. long, and usually marked with longitudinal lines. As the acorns take two years to mature, immature acorns are usually present on most plants. *OCCURRENCE*: widespread and locally common to abundant in chaparral on the higher ridges of the Tassajara region, but generally uncommon below about 1,700 ft. elevation. *DISTRIBUTION*: Coast Ranges, Tehachapi Mts., Transverse and Peninsular Ranges, from Shasta Co. to the mountains of northern Baja California (the tree variety has a similar range, but is primarily of the Sierra Nevada Foothills and northern Coast Ranges). *NOTE*: as the tree form of this species occurs in other areas of the Santa Lucia Mts., it may present somewhere in the Tassajara region. ⊕March-May.

Note on *Fagaceae*.

As *Quercus john-tuckeri* (*Q. turbinella* subsp. *californica*) is reported to occur in the lower Arroyo Seco drainage and on some of the higher ridges of the Santa Lucia Mts. (re. Griffin '75), and *Q. berberidifolia* (*Q. dumosa*) is reported to occur in the watershed of the Arroyo Seco River (re. Howitt & Howell '64), one or both these shrubby live-oaks may occur somewhere in the Tassajara region. It is also possible that some of the plants of this region may represent hybridized oaks.

GARRYACEAE. SILK-TASSEL FAMILY.

A family comprised of only one genus.

GARRYA. SILK-TASSEL.

Eighteen species of North America and the Caribbean Islands.

Garrya flavescens Watson [*G. f.* var. *pallida* (Eastwood) Ewan]. ASHY SILK-TASSEL, PALE SILK TASSEL (p 106). *HABIT*: evergreen shrubs ranging from about 1.5 to 4.5 m. (5-15') tall. *LEAVES*: opposite and with petioles about 4 and 10 mm. long, the blades grayish green, oval to elliptic with entire margins, and about 3 to 9 cm. long. *INFLORESCENCE*: the flowers are produced in silky and dangling catkins, with those of staminate plants are about 3 to 6 cm. long, while those of pistillate plants are about 2 to 7 cm. long. *FRUIT*: small ovoid berries about 6 to 8 mm. long. *OCCURRENCE*: locally common in chaparral along the Black Cone Trail between South Ventana Cone and the Elephant's Back, and scattered in chaparral along the Marble Peak Trail between the Willow Creek Divide and Camp Creek. Although this species was not seen elsewhere in this region, it probably occurs in other areas that are not accessible by trails. *DISTRIBUTION*: Coast Ranges (from Lake and Mendocino Counties southward), and the Sierra Nevada (from Fresno and Inyo Counties southward), to the Transverse and Peninsular Ranges of southern California and northern Baja California, and eastward to southwestern Utah and central Arizona. The species generally occurs between 1,500 to 8,000'. ⊕Feb.-April.

GERANIACEAE. GERANIUM FAMILY.

Eleven genera and about 780 species of annual and perennial herbs, most of which occur in northern temperate regions and in southern Africa.

1a. Leaves pinnately divided. Fertile stamens 5. . . . . ***Erodium***.
1b. Leaves palmately divided. Fertile stamens 10. . . . . ***Geranium***.

ERODIUM. FILAREE, STORK'S-BILL, CLOCKS.

About 75 species of annual and perennial herbs of temperate Eurasia, North Africa, the Americas and Australia. The carpels retain an awn-like section of the style which becomes coiled when dry, but unwinds when water is applied. This adaptation helps to drill the carpels into the ground at the start of the rainy season.

1a. Mature styles usually more than 9 cm. long. Leaves divided into fairly broad segments. . . . . ***E. botrys***.
1b. Mature styles usually less than 4 cm. long. Leaves divided into numerous linear segments. . . . . ***E. cicutarium***.

***Erodium botrys** (Cavanilles) Bertoloni. LONG-BEAKED FILAREE (p 106). *HABIT*: annual herbs generally with ascending stems ranging from about 1 to 9 dm. (4-36") long. *LEAVES*: the blades are about 3 to 8 cm. long, ovate to oblong-ovate in outline, and pinnately divided into fairly broad and irregularly toothed lobes. The basal leaves are produced in loose rosettes on petioles about as long to longer than the blades, while the cauline leaves are opposite, and the uppermost are sessile. *INFLORESCENCE*: terminal and axillary, with the flowers produced singularly or in few-flowered umbels. *COROLLA*: five lavender to deep violet petals about 8 to 15 mm. long. *FRUIT*: the ovaries split into five carpels when mature, each of which retains a longitudinal section of the style. *OCCURRENCE*: widespread in the Tassajara region, and locally common in open grassland habitats. *DISTRIBUTION*: a common weed in California, native to Eurasia and North Africa. ⊕March-May.

***Erodium cicutarium** (Linnaeus) L'Heritier. RED-STEMMED FILAREE (p 106). *HABIT*: annual herbs varying in size depending on environment, from up to 5 dm (20") tall in richer and/or moister soils, to less than .5 dm. (2") tall in poor, dry, and highly exposed soils. *LEAVES*: the basal in loose rosettes and the cauline opposite, the

lower on petioles about as long to shorter than the blades and the upper-most sessile, the blades about 3 to 10 cm. long, lanceolate to oblanceolate or oblong in outline, and pinnately divided into generally narrow and pinnately toothed or lobed leaflets. *INFLORESCENCE*: terminal and axillary, with the flowers produced singularly or in few-flowered umbels. *COROLLA*: five rose-purple to lavender petals about 5 to 7 mm. long. *FRUIT*: the ovaries split into five carpels when mature, each of which retains a longitudinal section of the style. *OCCURRENCE*: widely scattered and locally common in open and usually grassy areas in the Tassajara region, especially in areas where the soil is poor and/or sandy. *DISTRIBUTION*: very common in California; probably native to Eurasia. *NOTE*: this species was present in California before large scale settlement by Europeans, for carpels have been found in some of the earliest adobe bricks made in the state, and the species was reported to have been common in the San Joaquin Valley before major settlement. These factors help to confuse the issue as to whether or not this species is alien or native to California (Wester '81). Most authors, however, believe this is a Eurasian species. The presence of carpels in adobe bricks suggests that this species was first established in and around mission communities, and it may have spread into the San Joaquin Valley via the fur and/or dung of large numbers of horses and cattle that had escaped from the mission communities (due to the presence of Grizzly Bears, the Spanish did not fence their pastures). There is also a theory that the species may have first arrived in California (from Mexico) via the feathers of migrating birds. ⊕Feb.-June.

GERANIUM. CRANESBILL.

About 250 to 300 species of temperate regions and tropical mountains. The showy-flowered geraniums of ornamental horticulture belong to the genus *Pelargonium*.

***Geranium dissectum** Linnaeus. CUT-LEAF GERANIUM (p 106). *HABIT*: annual herbs with erect or ascending stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: opposite and mostly long-petiolate, the blades roundish to deltoid in outline, about 3 to 6 cm. wide, and deeply cleft into five major segments which are further divided. *INFLORESCENCE*: the flowers are terminal and axillary in one's or two's. *FLOWERS*: five two-lobed and pale-pink to rose-purple petals about 5 to 7 mm. long. *FRUIT*: the ovaries split into five carpels when mature, each of which retains a longitudinal section of the style. *OCCURRENCE*: weedy in Pine Valley in the vicinity of Pine Valley Camp, and at Tassajara Hot Springs, where it is weedy in the streambed depression at the western end of the developed area (near the new bathhouse). The hot springs population has been established for more than 30 years, for Tassajara Springs was listed as a site for this species by Howitt and Howell ('64). *DISTRIBUTION*: a common weed in North America; native to Eurasia. ⊕March-June.

GROSSULARIACEAE. GOOSEBERRY FAMILY.

A family comprised of one genus. The genus is often treated as a subfamily of *Saxifragaceae* (Saxifrage Family).

RIBES. CURRANTS AND GOOSEBERRIES.

About 120 species of shrubs or subshrubs which are widely distributed in the temperate regions of the northern hemisphere and South America. Some authors recognize two genera: *Grossularia* (gooseberries) and *Ribes* (currants). Gooseberries represent plants which have thorny and/or spiny branches and more or less bristly fruits, while currents represent plants which are mostly to entirely without spines or bristles of any kind.

1a. Stems without thorns or spines. Flowers about 10 to 25 in terminal racemes. Fruits not bristly. . . . . ***R. malvaceum***.
1b. Stems with thorns at the nodes and sometimes with internodal spine-like bristles. Flowers singular or in two's or three's from the axils of the leaves. Fruits densely bristly:
2a. Stems with bristly spines between the nodes. Free part of flower tube about as long as broad. . . . . ***R. sericeum***.
2b. Stems not bristly between the nodes. Free part of flower tube longer than broad:
3a. Leaf-blades mostly 2 to 4 cm. long, the lower surface with glandular pores. . . . . ***R. amarum***.
3b. Leaf-blades mostly 1 to 2 cm. long, the lower surface without glandular pores. . . . . ***R. roezlii***.

Ribes amarum McClatchie [*Grossularia amara* (McClatchie) Coville & Britton]. BITTER GOOSEBERRY (p 106). *HABIT*: deciduous shrubs ranging from about 1 to 2 m. (40-80") tall. Plants growing in open areas tend to be rather stoutly branched and with an erect and generally rounded crown, while plants growing in shady areas tend be lanky. *LEAVES*: alternate or in alternate clusters, the petioles about 1 to 2.5 cm. long, the blades about 2 to 3.5 cm. long, ovate to roundish in outline, cordate at the base, and cleft into three to five primary lobes, the margins of which are crenately toothed. *INFLORESCENCE*: the pendulous flowers are produced singularly or in two's or three's from the axils of the leaves. *COROLLA*: five white or pinkish-white petals about 3 to 4 mm. long. The more conspicuous and reflexed sepals are tinged brownish or purplish-red. *FRUIT*: roundish and densely bristly berries about 1.5 to 2 cm. wide. *OCCURRENCE*: fairly common in the Church Creek area, and scattered along the floodplains of Tassajara Creek to the vicinity of Tassajara Hot Springs. Smaller leafed plants from the upper regions of Church Creek, Pine Valley, and along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, appear to represent plants that are intermediate with *R. roezlii*. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from the San Francisco Bay Area and El Dorado Co. to San Diego Co. ⊕March-April.

Ribes malvaceum Smith. CHAPARRAL CURRANT, WESTERN BLACK CURRANT (p 106). *HABIT*: generally erect shrubs with somewhat flexuous stems ranging from about 1 to 2 m. (40-80") tall. *LEAVES*: generally alternate or in alternate clusters, the petioles about 1 to 4 cm. long, the blades about 1 to 5 cm. wide, broadly ovate to roundish in outline, and divided into 3 to 5 shallow lobes, the margins of which are serrately toothed. *INFLORESCENCE*: drooping terminal racemes comprised of about 10 to 25 flowers. The flowers emit a spicy, incense-like scent. *COROLLA*: five pale-pink petals about 2 to 3 mm. long. The much more conspicuous calyces have pale-pink tubes and lavender to rose lobes. *FRUIT*: roundish berries about 6 to 7 mm. wide; the berries are purplish-black and covered with a whitish bloom. *OCCURRENCE*: widely scattered in chaparral and sometimes in woodland habitats in the Tassajara region, but relatively uncommon and tending to occur in small groups. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Tehama Co. to Los Angeles Co. Also on Santa Cruz Island. ⊕Oct.-March.

⇕**Ribes roezlii** Regel [*Grossularia r.* (Regel) Coville & Britton]. SIERRA GOOSE-

BERRY (p 106). *HABIT*: deciduous shrubs with erect to spreading branches ranging from about 5 to 12 dm. (20-48") long. *LEAVES*: alternate or in alternate clusters, the petioles about .5 to 3 cm. long, the blades about .5 to 2.5 cm. long, ovate to roundish in outline, and cleft into three to five crenately margined lobes. *INFLORESCENCE*: the generally pendulous flowers are produced singularly or in two's or three's from the axils of the leaves. *COROLLA*: five white petals about 3 to 5 mm. long. The reflexed sepals are dull reddish-purple. *FRUIT*: roundish and densely bristly berries about 14 to 16 mm. wide. *OCCURRENCE*: scattered in shady and sometimes moist habitats above about 4,000 ft. on Chew's Ridge and in adjacent areas, such as the upper regions of Miller Canyon and along the first ¼ of a mile or so of the Pine Ridge Trail west of Tassajara Rd. *DISTRIBUTION*: from the southern Cascades and the mountains of the Modoc Plateau southward, through the Sierra Nevada, to the Tehachapi Mts., the Transverse Ranges, and Peninsular Ranges (to San Diego Co.), with a disjunct population on the higher peaks and ridges of the Santa Lucia Mts. of Monterey Co. *NOTE*: plants in Pine Valley, the upper regions of Church Creek, and along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, may represent a population which is to some degree intermediate with *R. amarum*. Such plants generally resemble *R. roezlii*, but the lower surfaces of the leaves have a scattering of glandular pores. ⊕May-June.

○**Ribes sericeum** Eastwood [*Grossularia sericea* (Eastwood) Coville & Britton]. SANTA LUCIA GOOSEBERRY (p 106). *HABIT*: lanky deciduous shrubs with widely spreading branches ranging from about 1 to 2 m. (3.3-6.6') long. *LEAVES*: alternate or in alternate clusters, the petioles about 1 to 3.5 cm. long, the blades about 1 to 3.5 cm. long, roundish to broadly ovate in outline, cordate to truncate at the base, and cleft into three to five crenately margined lobes. *INFLORESCENCE*: the pendulous flowers are produced singularly or in two's or three's from the axils of the leaves. *COROLLA*: five white petals about 3 to 4 mm. long. The much more conspicuous sepals are dull red or reddish-purple. *FRUIT*: roundish and densely bristly berries about .8 to 2 cm. wide. *OCCURRENCE*: scattered along Willow Creek from about ½ of a linear mile west of Willow Creek Camp to about ¼ of a linear mile east of the confluence with Tassajara Creek. For about 10 years a lone plant persisted on a precarious rocky bank along Tassajara Creek about ¼ of linear mile south-southwest of the developed area of Tassajara; but at some point in recent years this plant has disappeared. *DISTRIBUTION*: endemic to the Santa Lucia Mts. of Monterey Co. and northwestern San Luis Obispo Co., and occurring mostly along streams in seaward-facing canyons. ⊕Feb.-May.

Note on *Grossulariaceae*.

Other *Ribes* species which are reported from areas of the Santa Lucia Mts. near or relatively near the Tassajara region include: *R. aureum* var. *gacillimum*, *R. californicum*, *R. quercetorum*, and *R. speciosum*.

HIPPOCASTANACEAE. BUCKEYE or HORSE-CHESTNUT FAMILY.

Three genera and about 18 species of relatively small trees and shrubs of the northern temperate regions and Central and South America.

AESCULUS. BUCKEYE.

Thirteen species of temperate and subtropical North America and Eurasia.

Aesculus californica (Spach) Nuttall. CALIFORNIA BUCKEYE (p 109). *HABIT*: deciduous trees or large shrubs with rounded crowns ranging from about 3 to 10 m. (10-32') tall. *BARK*: relatively smooth and light-gray. *LEAVES*: opposite and with petioles about 1 to 12 cm. long, the blades palmately divided into five to seven oblong-lanceolate leaflets about 5 to 15 cm. long, the margins of which are finely serrate. This species is unusual in that it starts to shed its leaves in mid to late summer. *INFLORESCENCE*: the flowers are numerous in conical to oblong panicles about 1 to 2 dm. long. *COROLLA*: four or five white petals about 12 to 18 mm. long. *FRUIT*: a large pear-shaped capsule about 5 to 8 cm. wide, containing one large and roundish seed about 2 to 5 cm. wide. *OCCURRENCE*: common in woodlands along the Arroyo Seco, and in a narrow strip along Tassajara Creek below the Marble Peak Trail, from the confluence with the Arroyo Seco to near to where the Horse Pasture Trail crosses Tassajara Creek. *DISTRIBUTION*: Coast Ranges, from Humboldt and Trinity Counties to San Luis Obispo Co., the Sierra Nevada Foothills, from Shasta Co. to the Tehachapi Mts. of Kern Co. and the Transverse Ranges of northwestern Los Angeles Co. *NOTES*: isolated populations in Santa Barbara Co. and Riverside Co. are believed to have been planted by native Californians, who used ground seeds to stupefy fish (Griffin & Critchfield '76). ⊕May-June.

HYDROPHYLLACEAE. WATERLEAF or PHACELIA FAMILY.

A family comprised of 18 to 20 genera and about 250 to 300 species of annual and perennial herbs and shrubs. The family is represented on all continents except for Australia, and is particularly well represented in western North America. Thirteen genera are present in California, two of which are endemic to the California Floristic Province, and five more are nearly endemic. Of the approximately 130 species which are found in California, 99 occur within the California Floristic Province, and 65 are endemic to the province.

1a. Rhizomatic evergreen shrubs or subshrubs. Leaves entire or toothed, but not lobed or divided into leaflets. . . . . ***Eriodictyon.***

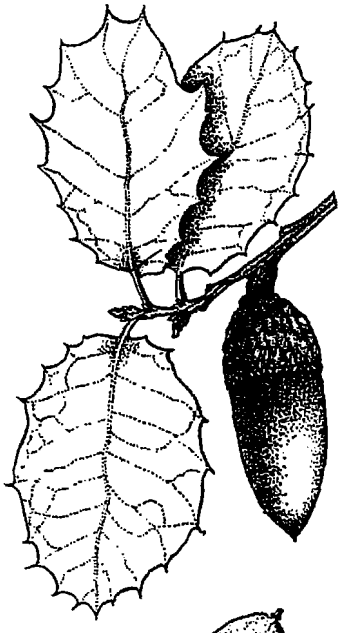
1b. Non-rhizomatic annual or perennial herbs (some perennial species may be slightly woody near the base). Leaves mostly deeply lobed or divided into leaflets (simple and sharply toothed in some annual species):

2a. Flowers produced in readily evident and mostly strongly coiled cymes. Calyces without reflexed appendages between lobes. Ovary two chambered:

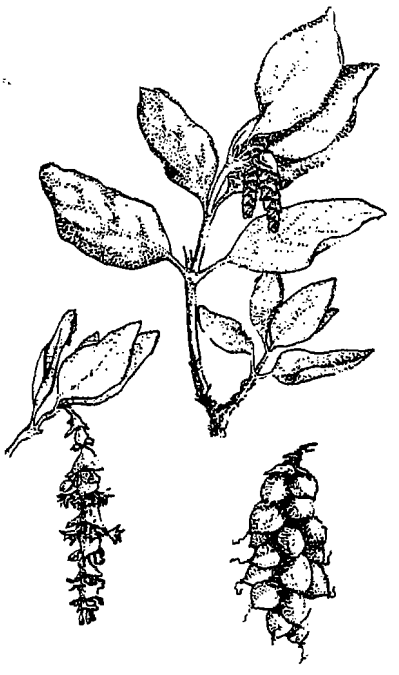
3a. Flowers generally facing downward in a pendulous manner. Corollas yellow, becoming dry and paper-like, and persisting to well after the fruits are mature. . . . . ***Emmenanthe.***

3b. Flowers generally facing upward or outward. Corollas not yellow (or only the tube is yellow), not becoming dry, and generally readily deciduous. . . . . ***Phacelia.***

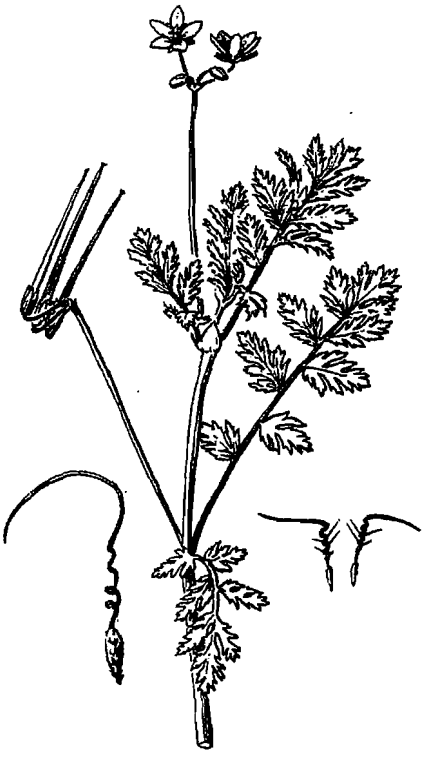
2b. Flowers solitary or remote in weakly coiled cymes. Calyces with minute or well developed reflexed appendages between the lobes. Ovary one chambered:



Quercus wislizenii frutescens



Garrya flavescens

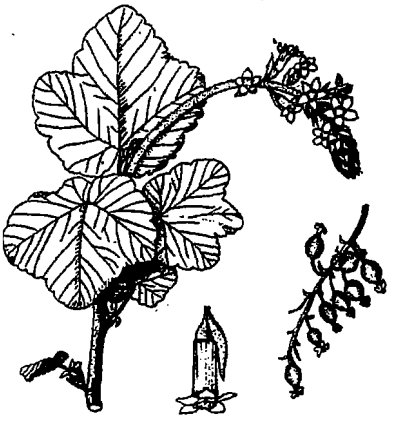


Erodium cicutarium

Erodium botrys

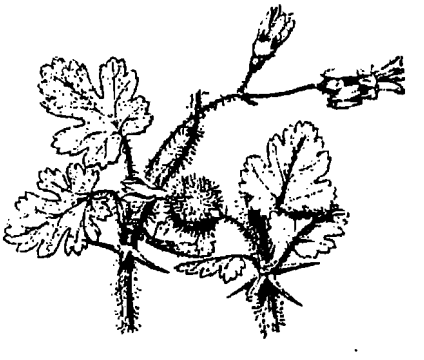
Geranium dissectum

Ribes amarum



Ribes malvaceum

Ribes roezlii



Ribes sericeum

4a. Stems with backwardly curved prickles that allow the plant to climb on other plants. Leaves strongly clasping the stem. . . ***Pholistoma.***
4b. Stems without prickles. Leaves not clasping the stem. . . . . ***Nemophila.***

EMMENANTHE. WHISPERING BELLS.

One species of southwestern temperate North America.

Emmenanthe penduliflora Benthem (p 112). *HABIT*: distinctive annual herbs with one to several erect branches ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: alternate, the lower short-petioled and the upper sessile, about 1 to 8 cm. long, narrowly oblong in outline, and with pinnately lobed margins. *INFLORESCENCE*: the flowers are pendulous in coiling terminal cymes. *COROLLA*: bell-shaped, light yellow, and about 6 to 15 mm. long. The corollas persist on the flowers well after anthesis, and after drying produce a rustling or "whispering" sound in a breeze. *FRUIT*: a compressed and many-seeded capsule about 7 to 10 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, but currently rare and restricted to disturbed areas in chaparral. *DISTRIBUTION*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Tehama and Nevada Counties to northern Baja California, and scattered eastward to Utah and Arizona. *NOTE*: this is one of the most noted of all "burn species" in California, i.e., annual herbs generally of chaparral habitats which are rare in well established ecosystems, but flourish in the first few years after disturbances, especially after fires. Although I have seen this species only a few times in this region, on chaparral slopes with loose and slipping soils and along recently cleared trails (such as along Tony's Trail and the Horse Pasture-Tassajara Cut-Off Trail, both in sections of the trails that had been cleared the year before), Vern Yadon reported it from Black Butte, along the Black Cone Trail, Never Again Ridge and the Elephant's Back in 1979 and 1980, two to three years after the Marble-Cone Fire of 1977. ⊛May-July.

ERIODICTYON. YERBA SANTA

Nine species of the southwestern United States and adjacent Mexico. Seven species occur in California, and six are endemic to the California Floristic Province.

1a. Leaves dark green and sticky (or blackish & sooty when old). Corollas 8 to 17 mm. long, funnel-shaped, and pale lavender to purple. . . ***E. californicum.***
1b. Leaves white-woolly and not sticky. Corollas 2 to 5 mm. long, urn-shaped, and white to pale lavender. . . . . ***E. tomentosum.***

⇩**Eriodictyon californicum** (Hooker & Arnott) Torrey. YERBA SANTA, MOUNTAIN BALM (p 109). *HABIT*: rhizomatic evergreen shrubs with erect stems ranging from about 6 to 22 dm. (2-7') tall. *LEAVES*: alternate and short petioled, the blades about 5 to 15 cm. long, lanceolate to oblong with toothed or sometimes entire margins, deep green, and covered with a sticky or glutinous, aromatic resin. Older leaves tend to be covered with a black and sooty fungus belonging to the genus *Heterosporium*, which is believed to have a symbiotic (mutually beneficial) relationship with the plants. *INFLORESCENCE*: the flowers are produced in terminal panicles, the branches of which are coiled at the apex. *COROLLA*: funnel-shaped, about 8 to 17 mm. long, and mostly pale-violet to lavender. *FRUIT*: a capsule about 2 to 3 mm. long and containing up to 20 seeds. *OCCURRENCE*: locally common in the Tassajara region, and found mostly in chaparral or in areas transitional between chaparral and other habitats. *DISTRIBUTION*: Coast Ranges, from southwestern Oregon to the Santa Lucia Mts. of northwestern San Luis Obispo Co., and the Sierra Nevada, as far south as Kern Co. *NOTE*: a tea made from the leaves is commonly used as an herbal remedy for colds, and extracts have been used as flavoring for candies. ⊛May-July.

Eriodictyon tomentosum Bentham. YERBA SANTA LUCIA, WOOLLY YERBA SANTA (p 109). *HABIT*: rhizomatic and white-woolly evergreen shrubs or subshrubs with erect or ascending branches ranging from about 1 to 2 m. (3.3-6.5') tall. *LEAVES*: alternate and short petioled, the blades elliptic-oblong to obovate with entire or crenately toothed margins, and about 4 to 6 cm. long. *INFLORESCENCE*: the flowers are produced in compact terminal panicles comprised of many branches which are coiled at the apex. *COROLLA*: about 2 to 5 mm. long, urn shaped, barely exceeding the calyx, and ranging from white to lavender. *FRUIT*: a hirsute capsule about 2 mm. long, containing 10 to 12 seeds. *OCCURRENCE*: widely scattered in chaparral in the Tassajara region, but generally uncommon, except for along the summit of Black Butte, where it is locally common to abundant. *DISTRIBUTION*: mostly in the Santa Lucia Mts. of Monterey County and north-western San Luis Obispo County, but also scattered in the Gavilan and Diablo Ranges to the east (in San Benito Co. and eastern and southeastern Monterey Co.). ⊛June-July.

NEMOPHILA.

About 11 species of western and southeastern temperate North America. The genus is particularly well represented in California, where seven of the species (plus six lesser taxa) occur, and four of these (plus four lesser taxa) are endemic to the California Floristic Province.

1a. Corollas 1 to 3.5 cm. wide, bright blue with white centers, and very conspicuous. Locally common in open and grassy habitats. . . . . ***N. menziesii.***
1b. Corollas less than 1 cm. wide, white or bluish-white, and inconspicuous. Found mostly in shady woodland habitats:
2a. Auricles (reflexed calyx appendages positioned between the sepals) at least 1/3 as long as the sepals. . . . . ***N. pedunculata.***
2b. Auricles rudimentary or less than 1/3 as long as the sepals:
3a. Leaflets or lobes remote and strongly narrowed to a petiole-like base. . . . . ***N. heterophylla.***
3b. Leaflets or lobes relatively close and not or only slightly narrowed at the base. . . . . ***N. parviflora.***

⇩**Nemophila heterophylla** Fischer & Meyer. VARIABLE-LEAFED NEMOPHILA (p 112). *HABIT*: delicate annual herbs with slender and trailing stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: the lower opposite and petiolate, the blades about 2 to 5 cm. long, ovate to oblong in outline and pinnately divided into two to three pairs of lateral leaflets or lobes, which are often irregularly 2 to 3-lobed. The reduced upper-most leaves are sometimes alternate, nearly sessile, and pinnately lobed. *INFLORESCENCE*: the inconspicuous flowers are produced in the axils of the leaves on very slender peduncles up to 5 cm. long. *COROLLA*: white, five-lobed, and mostly less than 6 mm. wide. *FRUIT*: a roundish capsule about 3 to 5 mm. wide. *OCCURRENCE*: scattered and locally common in shady woodland habitats in the Tassajara region, at least in the vicinity of Tassajara Hot Springs, and according to Yadon ('80b), in Bear Basin, but rare in

drought years and/or in years in which the rains come at irregular intervals. *Distribution*: Coast Ranges and Sierra Nevada Foothills, from southwestern Oregon to Monterey and Madera Counties. *Note*: the assignment of the plants of this region to *N. heterophylla* is somewhat tentative, for the plants exhibit a few characteristics which are inconsistent with the description of this taxa (Constance '41). The leaves of the local plants are rarely alternate above, and the lower leaves are about 4 to 5 cm. long and about 2.5 cm. wide (not 1.5-2.5 cm. long and .5-1.8 cm. wide). The auricles are about 1 mm. long (not about .5 mm. long), the corollas are about 4 to 6 mm. wide (not 5-10 mm. wide), and the styles are about 2 mm. long (not 2.5-3.5 mm. long). In some ways the plants in question resemble *N. pulchella* Eastwood var. *fremontii* (Elmer) Constance, which is also reported to occur in the Santa Lucia Mts., but they do not have rotate corollas or filaments that exceed the corolla tube. They also differ from *N. p.* var. *fremontii* in lacking a conspicuous basal rosette of leaves, in having auricles about 1 mm. long (not .5 mm. or wanting), in having corollas which clearly exceed the calyx (not approximately equalling the calyx), and in having styles which are about 2 mm. long and exserted from the calyx (not .5-1 mm. long, and not exserted from the calyx). ⊛April-May.

Nemophila menziesii Hooker & Arnott. BABY BLUE-EYES, CALIFORNIA BLUE-BELLS, MARIANAS (p 112). *Habit*: showy-flowered annual herbs typically with diffuse and generally ascending stems ranging from about 1 to 3 dm. (4-12") long. *Leaves*: opposite, the lower petiolate and the upper nearly sessile, the blades about 1 to 5 cm. long, oblong to oblanceolate in outline and pinnately divided into about 6 to 11 oblong to roundish lobes. *Inflorescence*: the flowers are produced singularly in the axils of the leaves and branches on pedicels about 2 to 6 cm. long. *Corolla*: broadly bowl-shaped, five-lobed, mostly about 1.5 to 3(+) cm. wide, bright powder-blue with dark blue veins distally, while the central region is white and speckled with blue dots. *Fruit*: a roundish many-seeded capsule about 5 to 12 mm. wide. *Occurrence*: widespread and locally common in open and usually grassy habitats in the Tassajara region, and one of the most conspicuous and well-known of the local wildflowers. *Distribution*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Tehama and Shasta Counties to San Diego Co. ⊛March-May.

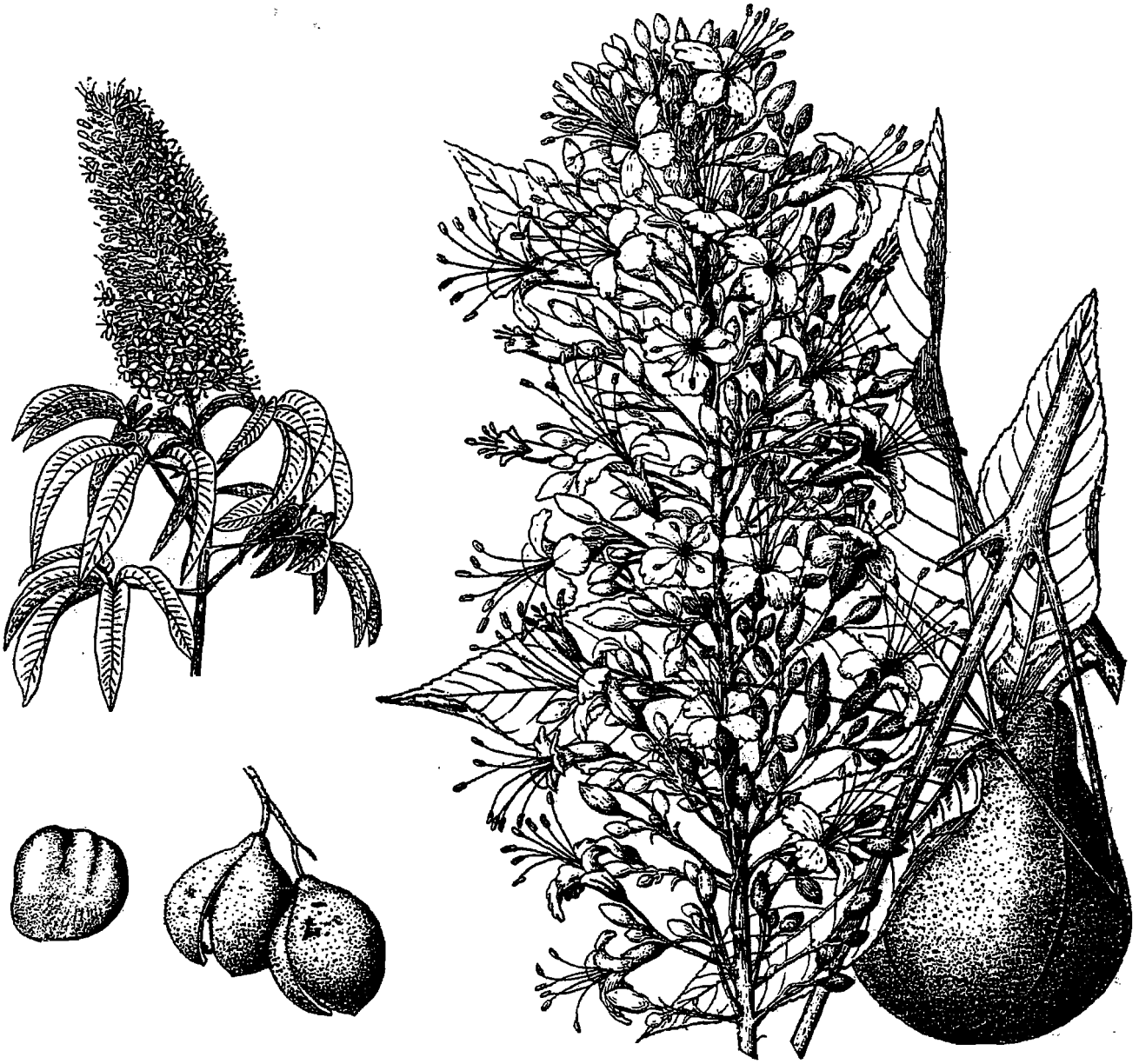
⇩**Nemophila parviflora** Douglas ex Bentham. SMALL-FLOWERED NEMOPHILA (p 112). *Habit*: delicate annual herbs with weak trailing stems ranging from about 1 to 6 dm. (4-24") long. *Leaves*: the lower opposite and petiolate and the upper-most alternate and nearly sessile, the blades about 1 to 4 cm. long, ovate to roundish in outline, and irregularly cleft into five lobes (inclusive of the terminal lobe). *Inflorescence*: the inconspicuous flowers are produced in the axils of the leaves on pedicels less than 3 cm. long. *Corolla*: white, five-lobed, about 1 to 5 mm. wide, and barely exceeding the lobes of the calyx. *Fruit*: a roundish two to four seeded capsule about 3 to 5 mm. wide. *Occurrence*: widely scattered and locally common in shady woodland habitats of the Tassajara region, but generally uncommon in drought years and/or in years in which the rains come at irregular intervals. *Distribution*: from British Columbia southward through the Cascades and Coast Ranges, to the Santa Lucia Mts. of Monterey Co. ⊛April-June.

Nemophila pedunculata Douglas. MEADOW NEMOPHILA (p 112). *Habit*: delicate annual herbs with weak and trailing stems ranging from about 1 to 3 dm. (4-12") long. *Leaves*: opposite and petiolate, the blades about 1 to 3 cm. long, oblong to obovate in outline and pinnately 5 to 9-lobed. *Inflorescence*: the flowers are small and produced in the axils of the leaves on pedicels about 4 to 12 mm. long (up to 4.5 cm. long in fruit). *Corolla*: white, bowl or bell-shaped, five-lobed, and mostly about 2 to 6 mm. wide. *Fruit*: a roundish capsule about 5 mm. wide and containing 2 to 8 seeds. *Occurrence*: apparently rare in the Tassajara region, for I have found this species at only on a shady north-facing slope near the summit of Tony's Trail (about three-quarters of a linear mile south of Tassajara Hot Springs). *Distribution*: Pacific Slope, from British Columbia to northern Baja California. *Note*: while the plants of this region have white corollas, plants with bluish corollas with purple blotches on the lobes and/or with dark veins or spots throughout are the most common in this species. ⊛April-June.

PHACELIA.

A highly variable genus of western North America, comprised of about 175 species of annual and perennial herbs and subshrubs. Over half of the species occur in California (94 plus 17 lesser taxa), and about 43 species (plus 8 lesser taxa) are endemic to the California Floristic Province.

1a. Annual herbs:
2a. Leaves bipinnately divided and rather fern like. Corollas (ours) pale-white with translucent veins. . . . . ***P. distans.***
2b. Leaves pinnately lobed or simple with toothed margins:
3a. Leaves broadly ovate to ovate-lanceolate and irregularly toothed or lobed:
4a. Corollas dark-blue with whitish centers. . . . . ***P. viscida.***
4b. Corollas white to pale lavender. . . . . ***P. grisea.***
3b. Leaves narrowly oblong in outline and pinnately lobed:
5a. Corollas purple to light-blue. . . . . ***P. douglasii.***
5b. Corollas white to yellowish or pinkish. . . . . ***P. brachyloba.***
1b. Perennial herbs, sometimes slightly woody at the base:
6a. Plants leafy throughout. Leaves bipinnately divided and somewhat fern-like:
7a. Stem hairs below inflorescence not stiff or with bulb-like bases. . . . . ***P. ramosissima.***
7b. Some of the stem hairs below inflorescence stiff and with bulb-like bases. . . . . ***P. ramosissima latifolia.***
6b. Plants with mostly basal leaves that form tufts (upper leaves are remote and much reduced in size). Leaves pinnately divided or lobed:
8a. Corolla more or less tubular, with the lobes mostly erect or curving inward at the apex. Calyx lobes generally broadly lanceolate or ovate and acuminate to acute at the apex. . . . . ***P. imbricata.***
8b. Corollas campanulate (bell or bowl-shaped), with the lobes curving outward at the apex. Calyx lobes generally narrowly lanceolate and acute at the apex. . . . . ***P. egena.***



Aesculus californica

Emmenanthe penduliflora

Eriodictyon californicum

Eriodictyon tomentosum

⇧**Phacelia brachyloba** (Bentham) Gray. SHORT-LOBED PHACELIA (p 112). *HABIT*: erect and often depauperate annual herbs with simple or branched stems ranging from about .5 to 6 dm. (2-24") tall. *LEAVES*: alternate, petiolate, and mostly restricted to the lower half of the plant, the blades about 1 to 7 cm. long, oblong to linear in outline, and pinnately divided into toothed or entire lobes or segments. *INFLORESCENCE*: the flowers are crowded in one to several coiling cymes. *COROLLA*: campanulate to funnelform, five-lobed, about 7 to 10 mm. wide, and with pale yellow tubes and white or sometimes pinkish lobes. *FRUIT*: an ovoid and 10 to 25 seeded capsule about 4 to 5 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, but rare and restricted to openings in chaparral, especially in more or less disturbed and/or sandy-soiled areas. I have seen this species in only in openings in chaparral along the crest of Black Butte, on Chew's Ridge near the lookout, and along a recently cleared section of Tony's Trail, about half way down the Willow Creek side of the grade. As this is one of the most noted "burn-species" in California, it is probably more common in this region after a fire. Miriam Bobcoff found this species in the developed area of Tassajara Hot Springs (on the hillside next to the upper-barn) within the first few years after the Marble Cone fire of 1977. *DISTRIBUTION*: outer Coast Ranges, Transverse and Peninsular Ranges, from Monterey Co. to northern Baja California. ⊛May-June.

Phacelia distans Bentham. FERN PHACELIA, WILD HELIOTROPE (p 112). *HABIT*: simple to freely branched annual herbs ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: alternate, the lower petiolate and the upper-most often sessile, the blades about 2 to 10 cm. long, oblanceolate to ovate in outline and one to three times pinnately divided into ultimate segments or lobes. *INFLORESCENCE*: densely floriferous coiling cymes which are produced at or near the ends of the branches. *COROLLA*: campanulate, five-lobed, and mostly about 8 to 10 mm. wide. The corollas of the local plants are pale-white with translucent veins (and thus appear somewhat dingy), although blue or bluish is the most common corolla color of this species. *FRUIT*: a roundish 2 to 4 seeded capsule about 2 to 3 mm. long. *OCCURRENCE*: widely scattered at lower to intermediate elevations in the Tassajara region, mostly in grassy openings in woodlands or chaparral, and often in areas with rather loose soil. *DISTRIBUTION*: from northern California to northern Baja California, and east to Nevada, Arizona, and Sonora, Mexico. ⊛April-June.

Phacelia douglasii (Bentham) Torrey. BABY PURPLE-EYES (p 112). *HABIT*: showy-flowered annual herbs with trailing or ascending stems ranging from about .5 to 4 dm. (2-16") long. *LEAVES*: primarily basal, the petioles about as long to much shorter than the blades, the blades about 1 to 8 cm. long, mostly narrowly oblong in outline and pinnately divided into irregularly shaped lobes. *INFLORESCENCE*: the flowers are produced in few to many-flowered and scarcely coiled cymes. *COROLLA*: bowl-shaped, five-lobed, about 6 to 12 mm. wide, purple or bluish-purple distally and fading white towards the center. *FRUIT*: an ovoid 10 to 20 seeded capsule about 5 to 7 mm. wide. *OCCURRENCE*: widely scattered and locally common on open grassy slopes in the Tassajara region. *DISTRIBUTION*: from the San Francisco Bay Area, the Sacramento/San Joaquin River Delta and adjacent Sierra Foothills, southward to western Riverside Co. ⊛ March-May.

Phacelia egena (Brand) J. T. Howell. LARGE-FLOWERED ROCK PHACELIA (p 112). *HABIT*: tufted and sometimes woody-based perennial herbs with erect stems ranging from about 1.5 to 6 dm. (6-24") tall. *LEAVES*: primarily basal and forming tufts, petiolate, about 10 to 25 cm. long, the blades generally oblanceolate in outline and with a large and generally ovate-lanceolate terminal leaflet and three to five pairs of more or less lanceolate lateral leaflets that increase in size towards the apex. The terminal leaflet is often partially fused with the upper-most pair of lateral leaflets. Upper leaves are remote and reduced in size. *INFLORESCENCE*: the flowers are produced in densely floriferous coiling cymes. *COROLLA*: pale-white, campanulate, five-lobed, and about 5 to 9 mm. wide. *FRUIT*: a narrowly ovoid and one to two-seeded capsule about 3 mm. long. *OCCURRENCE*: apparently widely scattered in the Tassajara region, but uncommon, and often difficult to clearly distinguish from the very similar and much more common *P. imbricata*. Some of the local plants may represent what was described by Heckard ('60) as a Coast Range form of *P. egena* which is to some degree genetically integrated with *P. imbricata*. *DISTRIBUTION*: Coast Ranges, Sierra Nevada and Transverse Ranges, from near the Oregon state line to northern Los Angeles Co. ⊛May-June.

Phacelia grisea Gray. SANTA LUCIA PHACELIA (p 112). *HABIT*: annual herbs with erect stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: alternate and petiolate, the blades ovate to broadly lanceolate or oblong with crenate to saliently lobed margins (or the lower-most sometimes nearly entire), and mostly about 1 to 6 cm. long. *INFLORESCENCE*: the flowers are crowded on the upper side of terminal and axillary cymes which are coiled at the apex. *COROLLA*: broadly campanulate, five-lobed, about 5 to 7 mm. wide, and white-translucent with white or very pale-lavender veins. *FRUIT*: an ovoid 5 to 10 seeded capsule about 4 to 5 mm. long. *OCCURRENCE*: apparently widely scattered in the Tassajara region, but currently rare. I have seen this "burn-species" only along the Pine Ridge Trail about ½ of a linear mile east of the Church Creek Divide (the yearly populations at this site varying from fairly common to absent) and along the Black Cone Trail between South Ventana Cone and the Elephant's Back. In contrast, Vern Yadon reported this species to be widely scattered and locally common to abundant on the higher ridges of the Tassajara region in 1979 and 1980, two and three years after the Marble Cone Fire of 1977. *DISTRIBUTION*: mostly in the Santa Lucia Mountains of Monterey and San Luis Obispo Counties, but also in the La Panza Range of San Luis Obispo Co. and the Santa Ynez Range of Santa Barbara Co. and western Ventura Co. ⊛May-June.

Phacelia imbricata Greene [*P. californica* var. *imbricata* Jepson]. ROCK PHACELIA, IMBRICATE PHACELIA (p 114). *HABIT*: often woody-based perennial herbs with erect stems ranging from about 2 to 10 dm. (8-40") tall. *LEAVES*: primarily basal and forming tufts, petiolate and about 5 to 15 cm. long, the blades generally oblanceolate in outline and with a large and generally ovate-lanceolate terminal leaflet and three to five pairs of more or less lanceolate lateral leaflets which increase in size towards the apex. The terminal leaflet is often partially fused with the upper-most pair of lateral leaflets. Upper leaves are remote and reduced in size. *INFLORESCENCE*: the flowers are produced in open panicles comprised of densely floriferous coiling cymes. *COROLLA*: cylindric to slightly campanulate, pale white, five-lobed, and about 4 to 7 mm. long. *FRUIT*: a narrowly ovoid and one to three-seeded capsule about 3 to 4 mm. long. *OCCURRENCE*: common in the Tassajara region, and found mostly in open and often rocky areas, particularly in transitional areas between woodlands and chaparral. *DISTRIBUTION*: Coast Ranges, from Humboldt Co. southward, and the Sierra Foothills, from Shasta Co. southward, to the San Gabriel Mts. of Los Angeles Co. ⊛May-Aug.

Phacelia ramosissima Douglas. BRANCHING PHACELIA (p 114). *HABIT*: perennial herbs with several widely spreading branches from a woody root-crown. Plants growing in sunny areas, such as in openings in chaparral, tend to have fairly rigid and arcing branches less than 1 m. (39") long, while plants growing in shady habitats tend to have weak and trailing branches which are often much more than 1 m. long. *LEAVES*: alternate and petiolate, the blades about 4 to 20 cm. long, broadly ovate in outline and pinnately divided into 5 to 9 generally oblong leaflets that are pinnately lobed or toothed. The upper-most leaves are much reduced in size and nearly sessile. *INFLORESCENCE*: an open panicle comprised of terminal and axillary spiraling and elongating cymes. *COROLLA*: campanulate, about 5 to 8

mm. wide, five-lobed, and mostly dingy bluish-white. *FRUIT*: an ovoid and 2 to 4 seeded capsule about 3 to 4 mm. long. *OCCURRENCE*: locally common in chaparral on Black Butte, and in transitional areas between mixed evergreen forest and chaparral along the Pine Ridge Trail between China Camp and Pine Ridge. Also scattered on Chew's Ridge. *DISTRIBUTION*: from Washington southward, through the Sierra Nevada and Coast Ranges, to the Tehachapi Mts., western Transverse Ranges, and the San Bernardino Mts. Also in the Panamint Range of Inyo Co. ⊛May-Aug.

Phacelia ramosissima var. **latifolia** (Torrey) Cronquist [*P. r.* var. *suffrutescens* Parry]. *HABIT*: like the typical species, except for remotely scattered stiff and bulb-based hairs on the stems below the inflorescence. *OCCURRENCE*: although I have only one specimen of this variety, which was collected along the Pine Ridge Trail at the first summit west of Tassajara Road, closer observation of the local populations of *P. ramosissima* is likely to reveal that this taxon is much more widespread in this region. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Santa Clara Co. to northern Baja California. Also in the Panamint Range of Inyo Co., and in Nevada and Arizona. May-Aug.

⇧**Phacelia viscida** (Bentham) Torrey. STICKY PHACELIA (p 114). *HABIT*: showy-flowered annual herbs with erect stems ranging from about 1 to 7 dm. (4-28") tall. *LEAVES*: alternate and petiolate, the blades about 3 to 9 cm. long, glandular-sticky, ovate to oblong-ovate, cuneate to truncate at the base, and with irregularly serrate or doubly serrate margins. *INFLORESCENCE*: the flowers are produced in open panicles on elongating coiling cymes. *COROLLA*: rotate, five-lobed, about 8 to 18 mm. wide, and mostly dark blue but whitish toward the center. *FRUIT*: an oblong-ovoid capsule about 8 to 12 mm. long, containing about 40 to 80 seeds. *OCCURRENCE*: currently rare in the Tassajara region and restricted to disturbed sites in chaparral. I have seen this species only along recently cleared sections of two trails: the Horse Pasture-Tassajara Cutoff Trail (along the switchback through chaparral between the base and top of the Horse Pasture Creek waterfall), and Tony's Trail (about half way up the Willow Creek side of the grade). As this is a -noted "burn-species," it is likely to be much more common in this region during the first few years after a fire. *DISTRIBUTION*: outer Coast Ranges and western Transverse Ranges, from the Santa Lucia Mts. of Monterey Co. to the Santa Monica Mts. of Los Angeles Co., and on Santa Rosa, Santa Cruz, and Santa Catalina Islands. ⊛April-June.

PHOLISTOMA.

Three species of southwestern temperate North America.

Pholistoma auritum (Lindley) Lilja [*Nemophila aurita* Lindley]. FIESTA FLOWER, VELCRO PLANT (p 114). *HABIT*: somewhat vine-like annual herbs with weak and trailing stems ranging from about 3 to 12 dm. (1-4') long. The angles of the stems are equipped with minute backwardly-hooked prickles, which enable them to climb on other plants, as well as to cling to whatever passes by. *LEAVES*: the lower opposite and the upper alternate, the petioles expanded at the base and clasping the stem, the blades semi-succulent, oblong to lance ovate in outline and pinnately divided into 3 to 6 pairs of more or less retrorse divisions or lobes. *INFLORESCENCE*: the showy flowers are produced in loose and few-flowered terminal cymes or singularly in the axils of the upper leaves. *COROLLA*: mostly about 1 to 2 cm. wide, bowl-shaped with five rounded lobes, purplish-blue distally and fading to nearly white towards the center. *FRUIT*: a one to four-seeded capsule about 5 to 10 mm. wide. *OCCURRENCE*: widespread and locally common in shady or generally shady habitats in the Tassajara region. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Lake and Calaveras Counties to northwestern Baja California. ⊛March-May.

Notes on *Hydrophyllaceae*.

Reports of *Phacelia davidsonii* (Howitt & Howell '64) and *P. curvipes* (Griffin '75) from near the summit of Chew's Ridge are probably based on a misidentified specimen of *P. douglasii*. The specimen was collected by Allen Barbour.

Hydrophyllaceae species which are reported to occur in areas of the Santa Lucia Mountains near or relatively near the Tassajara region (Howitt & Howell '64 and Griffin '75) include: *Phacelia cicutaria* var. *hispida*, *P. ciliata*, *P. malvifolia*, *P. nemoralis*, *P. rattanii*, and *P. tanacetifolia*.

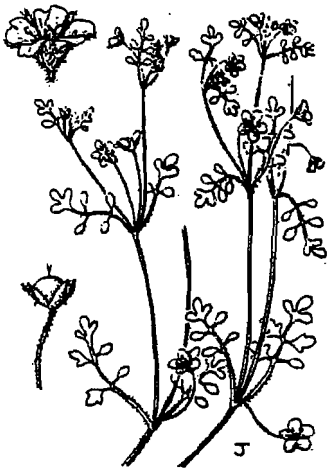
HYPERICACEAE. ST. JOHN'S WORT FAMILY.

A widely distributed family comprised of 10 genera and about 400 species. The species range from annual and perennial herbs to shrubs and trees.

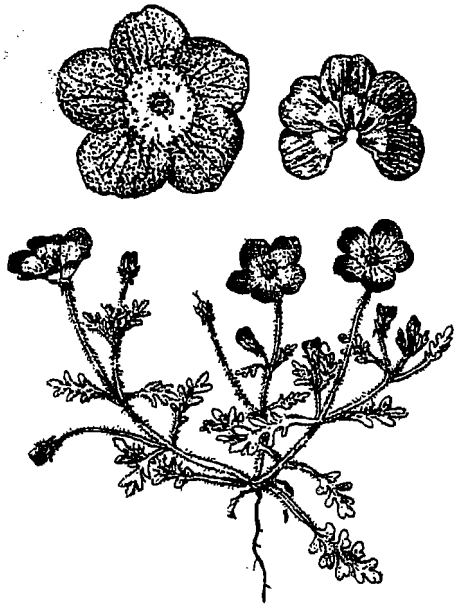
HYPERICUM. ST. JOHN'S WORT, TINKER'S PENNY.

About 350 species of annual and perennial herbs and shrubs.

Hypericum formosum Kunth var. **scouleri** (Hooker) Coulter (p 114). *HABIT*: rhizomatic perennial herbs with erect stems ranging from about 2 to 7 dm. (8-28") tall. *LEAVES*: opposite, sessile, oblong to ovate, and about 1 to 3 cm. long. *INFLORESCENCE*: the flowers are terminal and axillary in paniculate cymes. *COROLLA*: five obovate and yellow petals about 7 to 10 mm. long. *FRUIT*: a three-lobed capsule about 6 to 7 mm. long. *OCCURRENCE*: scattered in wet habitats in Pine Valley, and in a wet ditch along Tassajara Road a short distance below the Chew's Ridge summit. According to Griffin ('75), the species is also present at wet spots on Pine Ridge (perhaps at the spring at Pine Ridge Camp). *DISTRIBUTION*: widely distributed in the mountains of western North America, from British Columbia and Montana to southern California and Colorado. ⊛June-Aug.



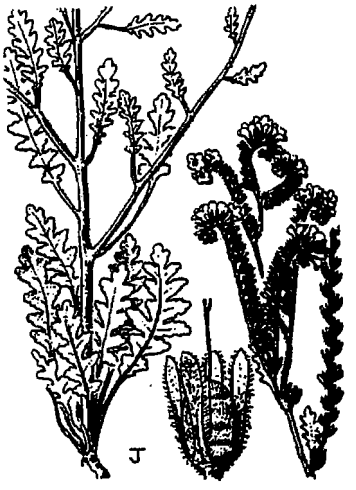
Nemophila heterophylla



Nemophila menziesii

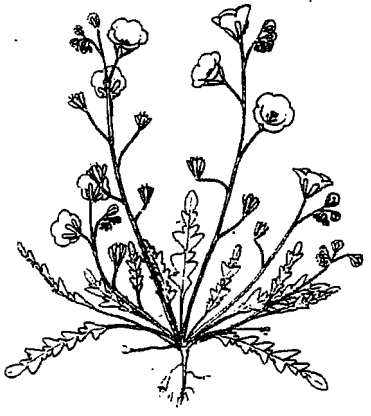
Nemophila parviflora

Nemophila pedunculata



Phacelia brachyloba

Phacelia distans



Phacelia douglasii

Phacelia egena

Phacelia grisea

LAMIACEAE (*Labiatae* or *Menthaceae*). MINT FAMILY.

A widely distributed family comprised of about 180 genera and 3,500 species of herbs and shrubs; the family is particularly well represented around the Mediterranean Sea. Due to the pleasantly aromatic nature of many of its species, *Lamiaceae* is a major source of culinary herbs, such as the various mints (*Mentha*), basil (*Ocimum*), sage (*Salvia*), thyme (*Thymus*), savory (*Satureja*), marjoram and oregano (*Origanum*), and rosemary (*Rosmarinus*). Other well known plants include lavender (*Lavandula*), *Coleus*, and catnip (*Nepeta cataria*). *Lamiaceae* is well represented in the Tassajara region, and includes some of the most common and/or conspicuous of the local plants.

1a. Stamens and style exserted beyond the corolla tube (and lobes) by at least twice the length of the tube. Nutlets attached wholly or partially by the side, and thus may appear as a unit before separation. . . . . ***Trichostema.***
1b. Stamens and/or style generally not exserted beyond the corolla tube for more than twice the length of the tube, and not or only slightly beyond the corolla lobes. Nutlets attached at the base, thus each nutlet is distinct, even before full maturation:
2a. Corollas weakly bilabiate, the five lobes slender and nearly equal in length, the upper two lobes united for most of their length. . . . . ***Monardella.***
2b. Corollas strongly bilabiate, the two to five lobes not equal in size and/or shape:
3a. Leaves and stems covered with a dense coat of white-woolly hair. Calyces with ten hooked teeth that become hardened when dry, thus the calyces are bur-like in maturity. . . . . ***Marrubium.***
3b. Leaves and stems not woolly or only the lower surface of the leaves woolly. Calyces two or five lobed (or toothed), the calyces not becoming bur-like in maturity:
4a. Flowers with two fertile (anther-bearing) stamens. . . . . ***Salvia.***
4b. Flowers with four fertile stamens:
5a. Calyces with two entire lobes of nearly equal size and shape. Stamens concealed within a dome-like upper lip. . . . . ***Scutellaria.***
5b. Calyces with five lobes or teeth of equal or unequal length. Stamens exposed:
6a. Shrubs or subshrubs. Corolla tube strongly inflated, the upper lip four lobed. . . . . ***Lepechinia.***
6b. Herbaceous perennial herbs or subshrubs (the stems slightly woody and trailing in *Satureja douglasii*, sometimes woody at the base in *Satureja mimuloides*). Corolla tube slender, the upper lip two lobed:
7a. Flowers produced in the axils of the leaves. . . . . ***Satureja.***
7b. Flowers produced in whorls in a terminal spike or head-like inflorescence (the lower-most flowers may be present in the axils of the upper-most leaves). . . . . ***Stachys.***

LEPECHINIA. PITCHER SAGE.

About 40 species of California, Mexico, and South America.

Lepechinia calycina (Bentham) Epling [*Sphacele calycina* Bentham]. (p 114). *HABIT*: aromatic shrubs or subshrubs with somewhat lanky and distally herbaceous stems ranging from about 6 to 22 dm. (2-7') tall. *LEAVES*: opposite and on petioles mostly about .5 to 2.5 cm. long, the blades about 3 to 12 cm. long, generally oblong-ovate, cuneate at base and obtuse at the apex, veiny, and with entire to irregularly toothed margins. *INFLORESCENCE*: the flowers are produced in short terminal racemes, the lower-most often in the axils of the upper leaves. *COROLLA*: bilabiate with a strongly inflated tube and extended lower lip, pinkish-white, and about 2 to 3 cm. long. *FRUIT*: four roundish nutlets about 3.5 mm. long. *OCCURRENCE*: widely scattered in chaparral or as an understory in woodlands in the Tassajara region, but generally uncommon and usually occurring in small colonies. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Lake Co. to Ventura Co., and the Sierra Nevada Foothills, from Butte Co. to Mariposa Co. ⊕April-June.

MARRUBIUM. HOREHOUND.

About 30 species of perennial herbs that are native to Eurasia.

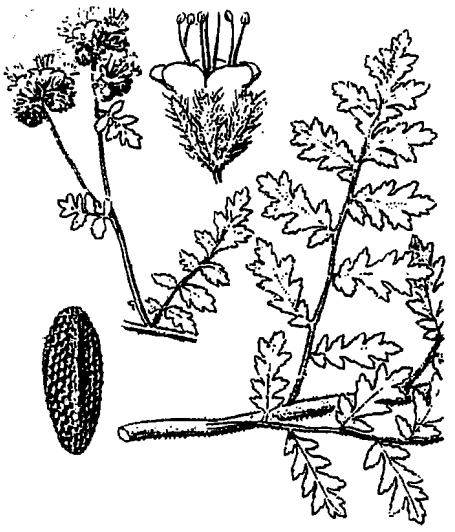
***Marrubium vulgare** Linnaeus. WHITE HOREHOUND (p 114). *HABIT*: white-woolly perennial herbs with erect or ascending stems ranging from about 2 to 6 dm. (8-24") long. *LEAVES*: opposite and petiolate, the blades ovate to roundish with crenately toothed margins, and about 1.5 to 5.5 cm. long. *INFLORESCENCE*: the flowers are produced in whorls which are positioned in the axils of the upper leaves. *COROLLA*: white, bilabiate, and about 5 to 6 mm. long. *FRUIT*: four nutlets. *OCCURRENCE*: lightly scattered in areas of the Tassajara region that have had more contact with human activity, such as in and the developed area of Tassajara Hot Springs, in The Flats, along Tassajara Road, etc. *DISTRIBUTION*: a common weed in California; native to Europe. *NOTE*: the ten-lobed calyces become bur-like when fully mature. ⊕June-Sept.

MONARDELLA. COYOTE MINT.

About 20 species of annual and perennial herbs of western North America.

1a. Corollas bright scarlet-red and 3.5 to 4.5 cm. long. . . . . ***M. macrantha.***
1b. Corollas blue to purplish-lavender or sometimes quite pale, and about 1 to 2 cm. long:
2a. Leaves glabrous or subglabrous. . . . . ***M. antonina.***
2b. Leaves pubescent to villous:
3a. Some to nearly all hairs forked, especially on the under surface of leaves. . . . . ***M. villosa obispoensis.***
3b. All hairs simple. . . . . ***M. villosa villosa.***

Phacelia imbricata



Phacelia ramosissima

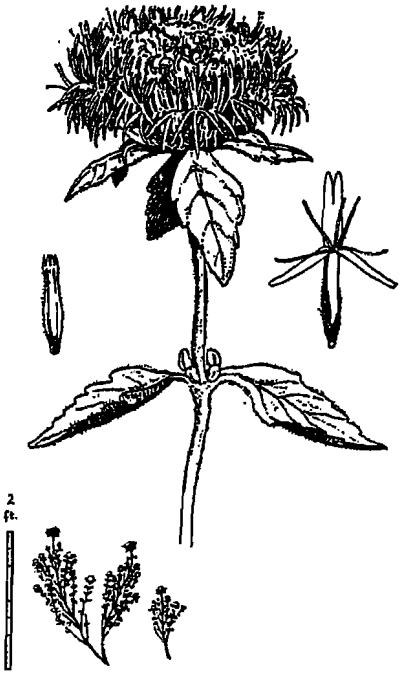
Phacelia viscida

Pholistoma auritum

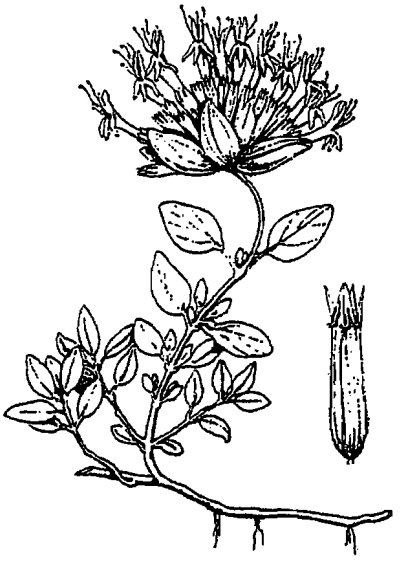
Hypericum formosum

Lepechinia calycina

Marrubium vulgare



Monardella antonina (gen. habit)



Monardella macrantha

○**Monardella antonina** Hardham. SAN ANTONIO FOOTHILLS COYOTE MINT (p 114). *HABIT*: aromatic evergreen perennials with slender, semi-woody, and erect or ascending stems ranging from about 1.5 to 6 dm. tall. *LEAVES*: opposite, petiolate and often with small and generally oblong-linear leaves clustered in the axils, the blades thin, narrowly ovate to narrowly lanceolate or elliptic, the margins entire or toothed, and the undersurface dotted with prominent oil-glands. The leaves have a rather pleasant taste that is like a combination of spearmint and thyme. *INFLORESCENCE*: the flowers are produced in dense and head-like terminal clusters about .5 to 2 cm. wide. *COROLLA*: about 8 to 15 mm. long, light to dark blue or bluish-purple or lavender, and with a narrowly funnelform tube and five slender lobes. *FRUIT*: four nutlets about 2 mm. long. *OCCURRENCE*: locally common in open or semi-open woodland habitats in the central regions of the Tassajara Canyon, such as in The Pines, the Horse Pasture, in the vicinity of Tassajara Hot Springs, but not seen elsewhere in this region. *DISTRIBUTION*: an uncommon taxon of the Santa Lucia Mts. of Monterey Co. (the type specimen is from the San Antonio Hills between Lockwood and San Ardo). *NOTES*: although the characteristics of the local plants are in many ways similar to the description of *M. antonina*, they also strongly correspond to the description of *M. sheltonii* Howell [*M. villosa* subsp. *sheltonii* (Torrey) Epling] of the North Coast Ranges and Sierra Nevada. A. D. E. Elmer's Tassajara Hot Springs specimen of June 1901 (Elmer #3224 DS), which is now assigned to *M. antonina*, was collected, according to a note enclosed in an envelope pasted to the sheet, in the Horse Pasture. Epling ('25) had assigned this specimen to *M. villosa* subsp. *sheltonii*. Elmer's specimen is perhaps the basis for what Hardham ('66a) referred to as follows: "introgression by *M. antonina* [with *M. villosa*] is probably the origin of most of the thin-leaved relatively glabrous *sheltonii*-like segregates of this complex which are found in some of the oak-pine habitats in the northern Arroyo Seco drainage." ⊛May-July.

⇧**Monardella macrantha** Gray. LARGE-FLOWERED COYOTE MINT (p 114). *HABIT*: aromatic perennial herbs with decumbent to trailing stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: opposite, the petioles about 2 to 15 mm. long, the blades about 5 to 30 mm. long, generally ovate with an obtuse apex, entire, and commonly tinged purplish, especially below. *INFLORESCENCE*: terminal head-like clusters about 2 to 4 cm. wide. *COROLLA*: bright scarlet, about 3.5 to 4.5 cm. long, and with a narrowly funnelform tube and five slender lobes. *FRUIT*: four straw-colored nutlets about 3 mm. long. *OCCURRENCE*: present in brushy openings in woodlands along the Pine Ridge Trail about half of a mile east of Pine Ridge (in the vicinity of the Tassajara Canyon overlook), and common in chaparral along the Marble Peak Trail between Shovel Handle Creek and Strawberry Valley. Although this species was not seen elsewhere in this region, it probably occurs in other areas that are not accessible by trails. *DISTRIBUTION*: scattered in the Santa Lucia Mts. of Monterey Co., the Santa Ynez Mts. of Santa Barbara Co., the San Gabriel Mts. of Los Angeles Co., and the Peninsular Ranges of San Diego Co. and northern Baja California, mostly between 2,500 and 6,000 ft. ⊛June-Aug.

⇩**Monardella villosa** Bentham [*M. v.* subsp. *subserrata* (Greene) Epling]. COYOTE MINT, YERBA POLES, POLEO (p 117). *HABIT*: aromatic and often tufted evergreen perennial herbs or subshrubs with slender and erect or ascending stems ranging from about 1 to 6 dm. (4-24") tall. *LEAVES*: opposite, the petioles about 2 to 15 mm. long, the blades ovate to lanceolate, entire or irregularly serrate, and about .5 to 3 cm. long. *INFLORESCENCE*: dense head-like terminal clusters about 1 to 3 cm. wide. *COROLLA*: about 10 to 18 mm. long, with a narrowly funnelform tube and five slender lobes, and ranging from purplish-blue or bluish-purple to pinkish-lavender or sometimes fading to nearly white. *FRUIT*: four oblong nutlets about 1.5 to 2.2 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, mostly in openings in woodland habitats or in transitional areas between major habitat types, but generally uncommon. *DISTRIBUTION*: from Humboldt Co. to Monterey Co. in the Coast Ranges, and from Amador Co. to Tuolumne Co. in the Sierra Foothills, ⊛May-July (-Sept.).

⇧**Monardella villosa** subsp. **obispoensis** (Hoover) Jokerst [*M. v.* var. *obispoensis* Hoover]. SANTA LUCIA COYOTE MINT. *HABIT*: similar to the typical species, except for the presence of forked hairs. The hairs of such plants also tend to be longer and more dense, and the odor is often pennyroyal-like. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, primarily in open or semi-open woodlands, grassy openings in chaparral, or in transitional areas. *DISTRIBUTION*: Santa Lucia Mountains of Monterey and San Luis Obispo Counties, and the western Transverse Ranges of Santa Barbara Co. *NOTE*: plants in this region vary from having almost exclusively forked hairs to having just a few forked hairs scattered among simple hairs. ⊛May-July (-Sept.).

SALVIA. SAGE.

About 900 species ranging from annual herbs to shrubs. The genus is represented in tropical, subtropical and warmer temperate regions nearly worldwide, but is primarily of the tropical and subtropical regions of the Americas. The genus represents the true sages and the culinary and/or medicinal herbs known as "sage."

1a. Annual herbs with pinnately or bipinnately parted leaves. . . . . ***S. columbariae.***
1b. Perennial herbs or shrubs with simple and entire or toothed leaves:
2a. Leafy-branched shrubs. . . . . ***S. mellifera.***
2b. Perennial herbs with primarily basal leaves:
3a. Leaves ovate-hastate to oblong-hastate. Corollas red or reddish. . . . . ***S. spathacea.***
3b. Leaves oblong-elliptic to oblong-spatulate. Corollas blue to blue-violet. . . . . ***S. sonomensis.***

Salvia columbariae Bentham. CHIA (p 117). *HABIT*: aromatic annual herbs with one to several erect stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: produced in basal rosettes and sometimes at the lower nodes, about 2 to 10 cm. long, mostly oblong-ovate in outline and pinnately or bipinnately parted into toothed or incised segments. *INFLORESCENCE*: the flowers are borne in roundish terminal glomerules or sometimes in two to three remote glomerules. *COROLLA*: bilabiate, dark-blue, and about 8 to 14 mm. long. *FRUIT*: four dorsally flattened nutlets about 2 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and locally common on open slopes and in openings in chaparral, especially in areas with loose or poor soils. *DISTRIBUTION*: Coast Ranges, Sierra Foothills and mountains of southern California, from Mendocino and Calaveras Counties to northern Baja California, and eastward to Utah, Arizona, and Sonora, Mexico. *NOTE*: the nutlets of this species were an important food source for Native Americans. ⊛March-May.

Salvia mellifera Greene. BLACK SAGE, BEE SAGE, BLUE SAGE, BALL SAGE, BUTTON SAGE (p 117). *HABIT*: aromatic evergreen shrubs with rounded crowns ranging from about 1 to 2 m. (40-80") tall, the branches of which are distally herbaceous. *LEAVES*: opposite, subsessile or on petioles up to 12 mm. long, the blades narrowly oblong to elliptical with crenulately toothed margins, and about 2 to 6 cm. long. *INFLORESCENCE*: terminal and spike-like, with the flowers clustered in prominent and fairly remote glomerules. *COROLLA*: bilab-

iate, pale blue-lavender to nearly white, and about 8 to 12 mm. long. *Fruit*: four oblong and dark brown nutlets about 2 mm. long. *Occurrence*: common and conspicuous in chaparral at lower to intermediate elevations of the Tassajara region, and particularly abundant on south-facing slopes. *Distribution*: Coast, Transverse and Peninsular Ranges, from Contra Costa Co. to northern Baja California. *Note*: the nectar of this species is highly favored by bees. ⊛ May-July.

Salvia sonomensis Greene. CREEPING SAGE, SONOMA SAGE (p 117). *Habit*: aromatic evergreen perennial herbs tending to form densely leafy mats via a system of creeping rhizomes. The leafless or nearly leafless flowering stems range from about 1 to 4 dm. (4-16") tall. *Leaves*: long-petiolate, the blades oblong-elliptic to oblanceolate with minutely crenulate margins, and about 3 to 6 cm. long. *Inflorescence*: spike-like, with the flowers produced in fairly remote whorls. *Corolla*: bilabiate, light blue to lavender, the upper lip comprised of two very small lobes while the much larger lower lip is narrowed in the middle before flaring into a broad terminal lobe. *Fruit*: four oblong nutlets about 2.5 mm. long. *Occurrence*: locally common in openings in chaparral along the Marble Peak Trail from the upper Willow Creek drainage (about half way between the last crossing of Willow Creek and the Willow Creek Divide) to Strawberry Valley, but not known to occur elsewhere in the Tassajara region, although it is locally common in the Arroyo Seco watershed, such as in Hanging Valley (about 5½ linear miles southeast of Tassajara Hot Springs). *Distribution*: scattered in the Coast Ranges and Sierra Nevada Foothills, from Siskiyou Co. to San Luis Obispo County and to Calaveras County, with a remote population in the Cuyamaca Mts. of San Diego Co. ⊛May-June.

Salvia spathacea Greene. CRIMSON SAGE, HUMMINGBIRD SAGE, PITCHER SAGE (p 117). *Habit*: aromatic perennial herbs from creeping rhizomes, with erect or ascending and relatively stout stems ranging from about 3 to 10 dm. (12-40") tall. *Leaves*: petiolate and primarily clustered towards the base of the stems, the blades mostly ovate-hastate to oblong-hastate (the blades of the reduced upper leaves merely truncate at the base), obtuse at the apex and with regularly or irregularly crenate to serrate margins, and about 8 to 20 cm. long. *Inflorescence*: terminal and spike-like, with the flowers produced in large, purplish-tinged, and fairly remote glomerules. *Corolla*: bilabiate, red to scarlet, purplish-red, or sometimes pale-rose, and about 3 to 4.5 cm. long. *Fruit*: four brown nutlets about 5 mm. long. *Occurrence*: widespread at lower to intermediate elevations of the Tassajara region (mostly below about 3,500'), and fairly common in shady or semi-shady woodlands and in openings in tall chaparral. *Distribution*: Coast, Transverse and western Peninsular Ranges, from Solano Co. to Orange Co. ⊛April-June.

SATUREJA. SAVORY.

About 150 species of perennial herbs and shrubs primarily of the Mediterranean Region, but also of Eurasia, Australia and North and South America. The culinary herb is *S. hortensis*.

1a. Evergreen herbs with slender, trailing, and slightly woody stems. Leaves less than 3 cm. long and with sparse and minute hairs. Corollas white and about 3 to 8 mm. long. . . . . ***S. douglasii***.

1b. Winter-deciduous herbs with relatively stout, generally erect, and non-woody stems. Leaves up to 8 cm. long and covered with long appressed hairs. Corollas orangish-red and about 15 to 35 mm. long. Plants of wet habitats. . . . . ***S. mimuloides***.

Satureja douglasii (Bentham) Briquet [*Micromeria chamissonis* (Bentham) Greene]. YERBA BUENA (p 117). *Habit*: aromatic perennial herbs with slender, slightly woody, and trailing branches ranging from about 2 to 6 dm. (8-24") long. *Leaves*: opposite and short-petioled, the blades mostly round-ovate with slightly crenate margins, and about 1 to 2.5 cm. long. The leaves have a sweet minty flavor which is similar to spearmint. *Inflorescence*: the flowers are small and inconspicuous, and produced in the axils of the upper leaves. *Corolla*: bilabiate, white or sometimes tinged with pink, and about 6 to 8 mm. long. *Fruit*: four shiny-brown nutlets about 1 mm. long. *Occurrence*: rare in the Tassajara region, and known to occur only on a shady bank above Tassajara Creek near the junction of the Horse Pasture and Marble Peak Trails. *Distribution*: outer Coast Ranges and western Transverse Ranges, from British Columbia to the Santa Monica Mts. of Los Angeles Co., and on Santa Catalina Island. ⊛ April-Sept.

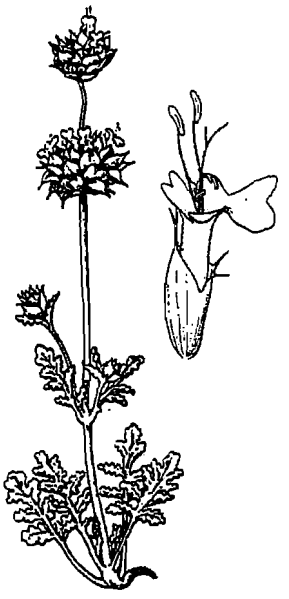
⇧**Satureja mimuloides** (Bentham) Briquet [*Clinopodium m.* (Bentham) Kuntze, *Calamintha m.* Bentham]. MONKEY-FLOWER MINT (p 117). *Habit*: aromatic perennial herbs with erect stems ranging from about 8 to 15 dm. (32-80") tall. *Leaves*: opposite and with petioles generally less than half as long as the blades, the blades ovate with serrately toothed margins, about 4 to 8 cm. long, often reddish-tinged below, and covered with a relatively dense layer of soft hair. *Inflorescence*: the rather showy flowers are produced in the axils of the upper leaves. *Corolla*: bilabiate, orangish-red, about 3 to 4 cm. long, and resembling the corollas of some *Mimulus* (monkey-flower) species. *Fruit*: four brown, smooth and ovoid nutlets about 2 mm. long. *Occurrence*: widely scattered in wet and usually shady habitats in the Tassajara region. *Distribution*: outer Coast Ranges and western Transverse Ranges, from the Santa Lucia Mts. of Monterey Co. to Santa Barbara Co., and again in the San Gabriel Mts. of Los Angeles Co. ⊛June-Oct.

SCUTELLARIA. SKULL-CAP.

About 300 species of perennial herbs mostly of temperate regions.

Scutellaria tuberosa Bentham [*S. t.* subsp. *australis* Epling]. BLUE SKULL-CAP (p 117). *Habit*: small perennial herbs from tuber-bearing rhizomes which annually produce one to several stems ranging from about .5 to 1.5 dm (2-6") tall. *Leaves*: opposite and with petioles up to 2 cm. long, the blades oval to ovate with crenately toothed margins, about 1 to 2 cm. long, and typically purplish tinged below. *Inflorescence*: the flowers are produced in the axils of the upper leaves. *Corolla*: bilabiate, dark purplish-blue with a white palate, and about 1.5 to 2 cm. long. *Fruit*: four black nutlets. *Occurrence*: widely scattered and locally common at lower to intermediate elevations in the Tassajara region, mostly in grassy openings in woodland habitats or sometimes in openings in chaparral, but fairly inconspicuous and easily overlooked. *Distribution*: from southwestern Oregon to Fresno Co. in the Sierra Nevada Foothills, and through the Coast, Transverse and Peninsular Ranges, to northern Baja California. ⊛April-June.

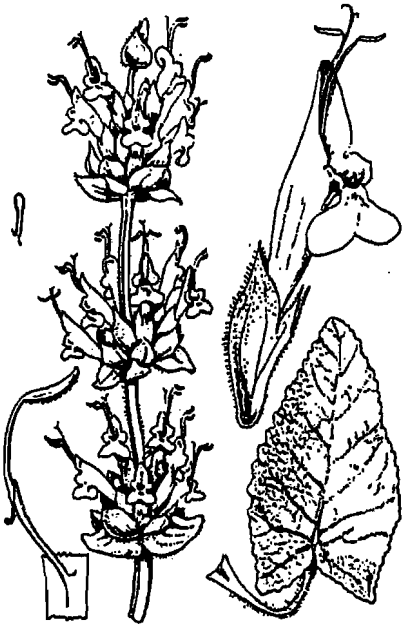
Monardella villosa



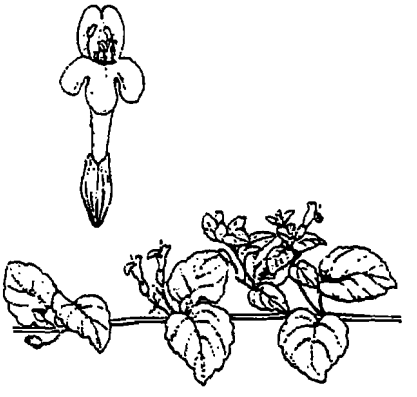
Salvia columbariae

Salvia mellifera

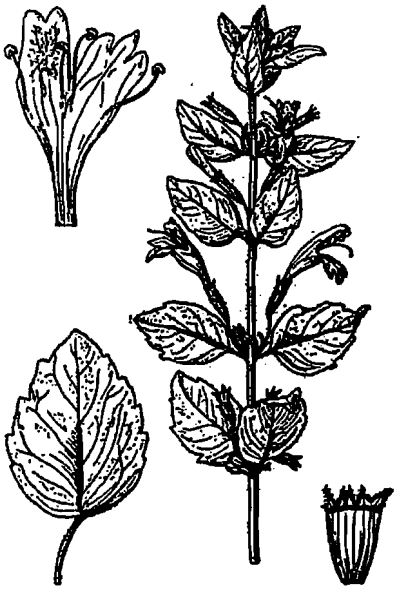
Salvia sonomensis



Salvia spathacea

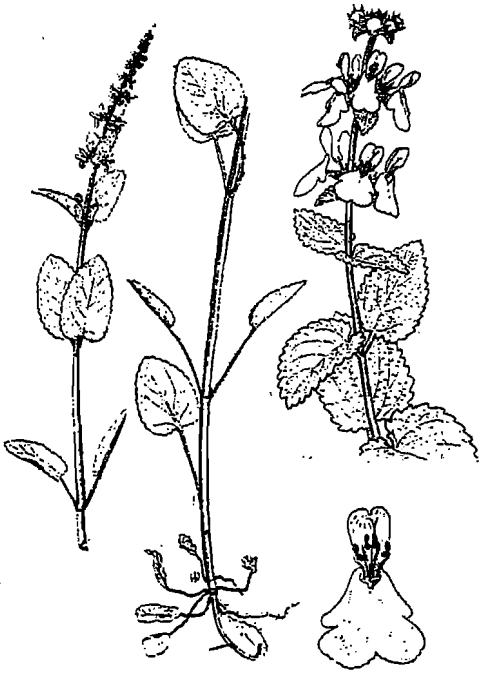


Satureja douglasii



Satureja mimuloides

Scutellaria tuberosa



Stachys bullata

STACHYS. HEDGE-NETTLE.

Approximately 300 species of annual and perennial herbs of temperate regions nearly worldwide (except Australia).

1a. Inflorescence generally more than 5 cm. long in maturity, the flowers produced in relatively remote whorls, with the lower flowers commonly produced in the axils of the upper leaves. . . . . ***S. bullata.***

1b. Inflorescence generally less than 5 cm. long in maturity, the flowers produced in adjoining whorls, with the lower-most flowers positioned above the upper-most leaves. . . . . ***S. pycnantha.***

Stachys bullata Bentham. WESTERN HEDGE NETTLE (p 117). *HABIT*: aromatic perennial herbs from creeping rhizomes, with erect stems ranging from about 4 to 8 dm. (16-32") tall. *LEAVES*: opposite, the lower petiolate and the upper often nearly sessile, the blades about 3 to 18 cm. long, mostly ovate to oblong-ovate, truncate to subcordate at the base and obtuse at the apex, and with crenate-serrate margins. *INFLORESCENCE*: the flowers are produced in fairly remote whorls on an elongated spike, with the lower flowers usually in the axils of the upper leaves. *COROLLA*: bilabiate, mostly rose-violet or pinkish with a white palate, and about 1 to 2 cm. long. *FRUIT*: four nutlets about 1.5 mm. long. *OCCURRENCE*: widespread and locally common in the Tassajara region, mostly in shady or semi-shady and generally moist or seasonally moist habitats. *DISTRIBUTION*: outer Coast Ranges, western Transverse Ranges, and coastal southern California, from San Francisco to Orange Co. ⊛April-July.

Stachys pycnantha Bentham. SHORT-SPIKED HEDGE NETTLE (p 119). *HABIT*: rhizomatic and strongly-scented perennial herbs with erect or ascending stems ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: opposite, mostly petiolate but the upper sometimes nearly sessile, the blades about 5 to 12 cm. long, glandular, ovate to oblong-lanceolate, rounded to subcordate at the base and obtuse at the apex, and the margins are crenately to serrately toothed. *INFLORESCENCE*: the flowers are produced in whorls in compact and head-like terminal spikes. *COROLLA*: bilabiate, white or pinkish with purple veins, the tube 6.5 to 8.5 mm. long, the upper lip 3 to 4 mm. long, the lower 5 to 7 mm. long. *FRUIT*: four small ovoid to oblong nutlets. *OCCURRENCE*: widely scattered along streambanks or sometimes at springs or seeps in the Tassajara region, but generally uncommon. *DISTRIBUTION*: an uncommon species of the Coast Ranges, from Contra Costa and Marin Counties to San Luis Obispo Co., and the Sierra Nevada, from Butte Co. to Sierra Co. *NOTE*: bees are extremely found of the nectar of this species, and when larger colonies are at the zenith of their flowering period (mostly mid to late summer), they attract dense swarms. ⊛June-Oct.

TRICHOSTEMA. BLUE-CURLS.

About 17 species of annual and perennial herbs and shrubs of North America. Ten species occur in California, and six are endemic to the California Floristic Province.

1a. Evergreen sub-shrubs of chaparral habitats. Inflorescence densely woolly. . . . . ***T. lanatum.***

1b. Annual herbs of open and usually grassy habitats. Inflorescence not densely woolly. . . . . ***T. lanceolatum.***

⇧**Trichostema lanatum** Bentham. WOOLLY BLUE-CURLS, CALIFORNIA ROSEMARY, ROMERO (p 119). *HABIT*: aromatic subshrubs with erect or ascending stems ranging from about 6 to 15 dm. (2-5') tall. *LEAVES*: opposite, sessile, bright-green, narrowly lance-linear with revolute margins, and about 3 to 7 cm. long. *INFLORESCENCE*: long and spike-like, with the flowers produced in small and subsessile cymes. The main stem is densely coated with reddish or purplish woolly hair. *COROLLA*: bilabiate and about 16 to 26 mm. long (inclusive of the lobes), blue and externally covered with woolly blue hair. The arcing and distally curling pale-blue stamens (and style) are two to three times longer than the corolla tube. *FRUIT*: four generally rectangular nutlets about 2 to 4 mm. long. *OCCURRENCE*: widely scattered in chaparral habitats at lower to intermediate elevations of the Tassajara region, and locally common in some areas, such as along the Church Creek Trail below Lime Point, and along Tony's Trail on the southfacing decent towards Willow Creek. *DISTRIBUTION*: outer Coast Ranges and coastal southern California, from Monterey and San Benito Counties to San Diego Co. *NOTE*: the Spanish name, Romero, is a generic term for rosemary or rosemary-like plants. ⊛May-Aug.

Trichostema lanceolatum Bentham. CAMPHOR WEED, VINEGAR WEED (p 119). *HABIT*: xerophytic and pungently aromatic annual herbs with one to several stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: opposite, the lower-most short petiolate and the rest sessile or subsessile, the blades lanceolate to lance-ovate, entire, glandular, and about 1 to 5 cm. long. *INFLORESCENCE*: elongated and somewhat spike-like, with the flowers produced in small axillary cymes. *COROLLA*: bilabiate, light-blue, and about 10 to 18 mm. long (inclusive of the lobes), with the tube abruptly bent upward near the throat. The arcing stamens and style greatly exceed the corolla tube. *FRUIT*: four nutlets about 1.5 to 3 mm. long which are crested with minute peg-like projections. *OCCURRENCE*: lightly scattered in open grassland habitats in the Horse Pasture and on the savannas above and north of Tassajara Creek east of Blackberry Creek, but not known to occur elsewhere in this region. *DISTRIBUTION*: from British Columbia to northern Baja California. ⊛Aug.-Oct.

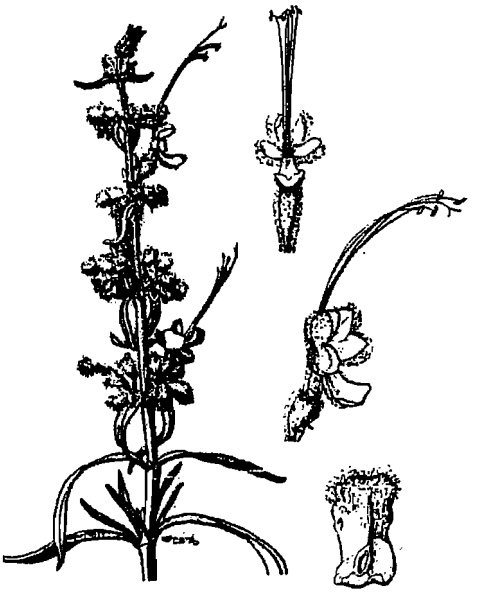
Notes on *Lamiaceae*.

Pogogyne serpylloides has been reported to occur in moist or seasonally moist habitats in areas of the Santa Lucia Mts. near the Tassajara region, and thus may occur in suitable habitats somewhere in the area.

A lone spearmint plant (*Mentha spicata*) has persisted on a rocky bank along Tassajara Creek immediately below The Narrows throughout the years of the preparation of this text. The plant is certainly a waif from the gardens of Tassajara Hot Springs or the Church Ranch.

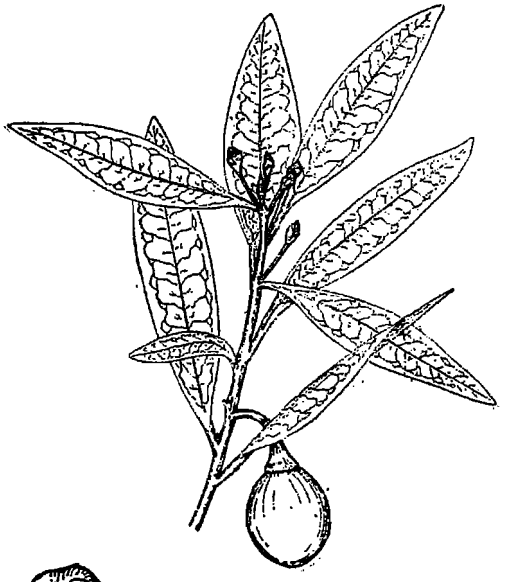
Weedy about the developed area of Tassajara Hot Springs (and formerly around the old composting site in The Flats) is *Lamium amplexicaule* (Giraffe Heads). This a relatively small annual herb about 1 to 4 dm. tall, with ovate to roundish leaves, and bilabiate and mostly purplish-red corollas about 10 to 18 mm. long, that have an arching upper lip and a spreading three-lobed lower lip.

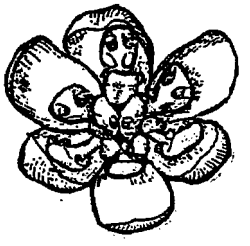
Stachys pycnantha



Trichostema lanatum

Trichostema lanceolatum





Umbellularia californica

LAURACEAE. LAUREL FAMILY.

About 32 to 45 genera and approximately 2,000 to 2,500 species of primarily tropical trees and shrubs, many of which are aromatic. The family includes the laurels (*Laurus*), cinnamon and camphor (*Cinnamomum*), avocado (*Persea*), and nutmeg (*Myristica*).

UMBELLULARIA. CALIFORNIA BAY-LAUREL.

One species of the California Floristic Province.

Umbellularia californica (Hooker & Arnott) Nuttall. CALIFORNIA BAY, CALIFORNIA LAUREL, OREGON MYRTLE, PEPPERWOOD TREE (p 119). *HABIT*: aromatic evergreen trees or shrubs with more or less conically-shaped crowns ranging from up to 30 m. (100') or more in mixed evergreen forests to less than 4 m. (12') tall in chaparral. *BARK*: relatively thin, scaly, and reddish to greenish-brown. *LEAVES*: alternate and short-petiolate, the blades oblong-lanceolate to elliptic with entire margins, shiny above and more pale below, and about 2 to 12 cm. long. *INFLORESCENCE*: the flowers are produced in small umbels which are positioned in the axils of the outer leaves. *COROLLA*: absent, although the six yellow or greenish-yellow sepals resemble petals in color and texture. The sepals are oblong-ovate and about 6 to 8 mm. long. *FRUIT*: aromatic and roundish to ovoid dupes about 2 to 2.5 cm. long, containing one large stone-like seed. The fruits, which mature in late summer, in many ways resemble an olive or miniature avocado, for they have a thin green skin and an oily and greenish inner flesh. *OCCURRENCE*: a common tree in woodland habitats in the Tassajara region, and occasionally as a large shrub in chaparral habitats. *DISTRIBUTION*: Coast Ranges and mountains of southern California, from southwestern Oregon to San Diego Co., and in the Sierra Nevada, from Shasta Co. to Kern Co. *NOTE*: like its European relatives, the leaves of this species are used as culinary herbs. ⊛Feb.-May.

LINACEAE. FLAX FAMILY.

A widely distributed but primarily temperate family comprised of about 13 genera and 300 species of herbs and shrubs. *Linum usitatissimum* is the source of linen and linseed oil.

HESPEROLINON. DWARF FLAX.

Thirteen species of annual herbs of the California Floristic Province, many of which are uncommon to rare and restricted to serpentine outcrops. Segregated from *Linum*.

Hesperolinon micranthum (Gray) Small [*Linum m.* Gray]. SMALL-FLOWERED DWARF FLAX (p 123). *HABIT*: small and usually freely branched annual herbs ranging from about .5 to 4 dm. (2-16") tall. *LEAVES*: alternate, sessile, narrowly linear, and about 1 to 2.5 cm. long. *INFLORESCENCE*: the flowers are produced in terminal cymes, and on filiform pedicels about 5 to 15 mm. long. *COROLLA*: five white to pink petals about .5 to 3.5 mm. long. *FRUIT*: an ovoid capsule about 1 to 2 mm. long. *OCCURRENCE*: according to Griffin ('75), this species is scattered on serpentine on Pine Ridge. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊛May-July.

LOASACEAE. LOASA FAMILY.

About 15 genera and 250 species of herbs and shrubs chiefly of tropical and subtropical regions of the Americas.

MENTZELIA. STICK-LEAF, BLAZING STAR.

Approximately 50 species of annual and perennial herbs and shrubs of tropical regions of the Americas and warmer temperate regions of western temperate North America. The leaves readily adhere to clothing or fur by being both glandular and equipped with hooked hairs.

1a. Floral bracts relatively small and not obscuring the flowers. Filaments not widened or forked at the apex. . . . . ***M. dispersa.***
1b. Floral bracts relatively large and obscuring the flowers when viewed from the side. Outer filaments widened and forked at the apex. . . ***M. micrantha.***

Mentzelia dispersa Watson. NADA STICK-LEAF (p 123). *HABIT*: glandular annual herbs with erect and upwardly branched stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: about .5 to 7 (-10) cm. long, entire or the lower cauline and basal leaves toothed, the lower-most larger, petiolate, produced in rosettes, and with linear-lanceolate or oblanceolate or sometimes elliptic blades, the upper shorter, alternate, sessile, and narrowly lanceolate to ovate. *INFLORESCENCE*: flowers are small and produced singularly or in small groups at and near the ends of the branches. *COROLLA*: five yellow petals about 2 to 5 mm. long. *FRUIT*: a slender capsule about 7 to 25 mm. long. *OCCURRENCE*: lightly scattered in openings in chaparral along the crest of Black Butte Ridge, but not known to occur elsewhere in this region. *DISTRIBUTION*: widely distributed in temperate North America, from Washington to northern Baja California and east to the north-central United States and New Mexico. ⊛May-Aug.

Mentzelia micrantha (Hooker & Arnott) Torrey & Gray. SMALL-FLOWERED STICK-LEAF, SAN LUIS STICK-LEAF (p 123). *HABIT*: glandular-sticky annual herbs with simple or freely branched stems ranging from about 1 to 9 dm. (4-36") tall. *LEAVES*: about 1 to 15 cm. long, the lower-most petiolate and produced in rosettes while the upper are alternate and sessile, the blades ovate to narrowly oblong with serrate or pinnately toothed margins, and sometimes with two opposing basal lobes. *INFLORESCENCE*: the flowers are small and produced in terminal cymes or singularly in the axils of the leaves or stems, and obscured (at least when viewed from the side) by floral bracts about 1 to 8 cm. long (the bracts are lanceolate to roundish and with entire or toothed margins). *COROLLA*: five yellow petals about 3 to 4 cm. long. *FRUIT*: a linear and sharply three-angled capsule about 7 to 9 mm. long. *OCCURRENCE*: apparently widely scattered in the Tassajara region, but rare and restricted to disturbed areas within chaparral, such as at landslides, in areas where the soil is loose and tends

to regularly slip downward, or sometimes along recently cleared trails. As this is a well noted "burn-species", it is likely to be locally common in chaparral habitats in this region during the first few years after a fire. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Trinity Co. to San Diego Co. ⊛April-July.

Notes on *Loasaceae*.

Mentzelia gracilenta is reported to occur in areas of the Santa Lucia Mts. near or relatively near the Tassajara Canyon and vicinity (Howitt & Howell '64 & '73), and thus may be present somewhere in this region.

Although Howitt & Howell ('73) reassigned Monterey Co. collections of *M. dispersa* to *M. pinetorum*, I have retained the former name in this text, and I suspect that the plants from Chew's Ridge which Griffin ('75) assigned to *M. veatchiana* actually represent *M. dispersa*.

LYTHRACEAE. LOOSESTRIFE FAMILY.

About 25 genera and 450 species of temperate and tropical regions worldwide. The family, which is comprised of annual and perennial herbs, shrubs and trees primarily in wet habitats, includes *Lagerstroemia* (crepe-myrtles), *Cuphea* (cigar-flower), and *Lawsonia* (*L. inermis* is the source of henna dye).

LYTHRUM. LOOSESTRIFE.

About 35 species of annual and perennial herbs of temperate regions. Most species occur in wet or seasonally wet habitats.

Lythrum californicum Torrey & Gray. CALIFORNIA LOOSESTRIFE (p 123). *HABIT*: densely foliated riparian herbs or subshrubs (older plants are often woody at the base), with erect or ascending branches ranging from about 3 to 12 dm. (1-4') tall. *LEAVES*: sessile, entire, linear to linear lanceolate or oblong, and mostly about 1 to 3 cm. long. The lower leaves are opposite while the upper are alternate. *INFLORESCENCE*: the flowers are small and produced singularly in the axils of the upper leaves. *COROLLA*: four to six bright purple petals about 4 to 8 mm. long. *FRUIT*: a two-celled membranous capsule about 4 to 7 mm. long. *OCCURRENCE*: scattered along the last half mile or so of Tassajara Creek and along the Arroyo Seco River in the vicinity of the confluence of Tassajara Creek, and occasionally upstream from Tassajara Hot Springs (Miriam Bobcoff once found it along Tassajara Creek at the confluence of Oryoki Creek). *DISTRIBUTION*: widely scattered in California, from the north Coast Ranges, Central Valley and Sierra Nevada Foothills to northern Baja California, and east to the central United States. ⊛April-Oct.

Notes on **MALVACEAE** (MALLOW FAMILY).

Citations in botanical literature concerning the existence of *Sidalcea hickmanii* (Santa Lucia Checkerbloom) in the vicinity of Tassajara Hot Springs are based on one of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June, 1901 (Elmer #3235 DS). According to a note enclosed in an envelope pasted to the specimen sheet, the site of Elmer's collection was in "Lost Valley between mounds" (about 5½ linear miles south of the hot springs). According to the California Natural Diversity Data Base this species does occur within the U.S.G.S. Tassajara Hot Springs 7.5 minute quadrangle (in which Lost Valley is located), but I was not able to find it in suitable habitats in the Tassajara region as defined in this text. *Sidalcea hickmanii* also occurs in Hanging Valley, about 5½ linear miles southeast of the hot springs. This is a perennial herbs from woody root-crowns, with generally reniform leaves with crenate margins, and relatively large pale pinkish-lavender petals about 12 to 25 mm. long. Elmer's specimen was one of the earliest collections of this rare Santa Lucia Mts. endemic.

Another *Malvaceae* species, *Malacothamnus palmeri* (Santa Lucia Bush Mallow), an uncommon plant of the Santa Lucia Mts., occurs in Hanging Valley and in the Big Sur area, and thus may occur somewhere in the Tassajara region. This is stout-stemmed shrub with ovate leaves with crenate or coarsely toothed margins, and rose-colored petals about 2 to 3 cm. long. The Hanging Valley population was segregated by Kearny as var. *lucianus* (Arroyo Seco Bush Mallow).

For many years two annual *Malvaceae* species have been weedy in the developed area of Tassajara Hot Springs: *Malva parviflora* (Cheese Weed) and *Malva nicaeensis* (Bull Mallow). Both are common weeds in California.

OLEACEAE. OLIVE FAMILY.

About 25 genera and 900 species of trees and shrubs primarily of temperate and tropical Asia. Well known genera include *Olea* (olive), *Syringa* (lilac), *Jasminum* (jasmine), and *Fraxinus* (ash).

FRAXINUS. ASH.

Approximately 65 species of trees and shrubs of tropical and temperate Eurasia and temperate North America.

Fraxinus dipetala Hooker & Arnott. **FLOWERING ASH, FOOTHILL ASH, CALIFORNIA ASH** (p 123). *HABIT*: large deciduous shrubs or small trees ranging from about 2 to 7 m. (6.5-23') tall. *LEAVES*: about 5 to 19 cm. long and pinnately divided into three to nine ovate to obovate and serrate-margined leaflets about 1 to 7 cm. long. *INFLORESCENCE*: the flowers are produced in small axillary panicles which appear at about the same time as the new leaves. *COROLLA*: two white petals about 2.5 to 4 mm long. *FRUIT*: two winged nutlets (samaras) about 2 to 3 cm. long. *OCCURRENCE*: scattered on steep slopes above the west bank of the Arroyo Seco River a short distance south of the Horse Bridge, but not known to occur elsewhere in the Tassajara region. As this is a species of both chaparral and woodland habitats, it may also occur in other areas of this region that are not accessible by trails or major waterways. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Siskiyou and Shasta Counties to San Diego Co. *NOTE*: the listing of Tassajara Springs as a Monterey Co. site for this species by Howitt & Howell ('64) was based on a specimen collected by Mary Strong Clemens on Oct. 3, 1921 (CAS). The location stated on the label is simply "Tassajara Springs, Monterey Co." ⊛March-April.

ONAGRACEAE. EVENING PRIMROSE FAMILY.

A widely distributed family of about 15 genera and 650 species of annual and perennial herbs, shrubs, and a few trees. The family is well represented in western North America, and especially in California. Eight genera and about 136 species occur within the state, and many species are endemic to the California Floristic Province.

1a. Sepals remaining erect after flowers open. Seeds with commas (tufts of fibers at the apex). . . . . ***Epilobium.***
1b. Sepals spreading or turning downward as the flowers open. Seeds without commas:
2a. Petals white, drying pink or red. Flower tube not prolonged beyond the ovary. Ovary two-celled. . . . . ***Gayophytum.***
2b. Petals rarely pure white. Flower tube prolonged beyond the ovary. Ovary four-celled:
3a. Petals pink to lavender, deep reddish-purple, or sometimes white or mostly white, often patterned, and, in most species, more than 1 cm. long. Anthers attached to the filament near the base. Stigmas four-lobed. . . . . ***Clarkia.***
3b. Petals yellow (often turning red or green with age), not patterned, and, in most species, less than 1 cm. long. Anthers attached to filament at or near the middle. Stigmas head-like. . . . . ***Camissonia.***

CAMISSONIA. SUN-CUP, ANNUAL EVENING PRIMROSE.

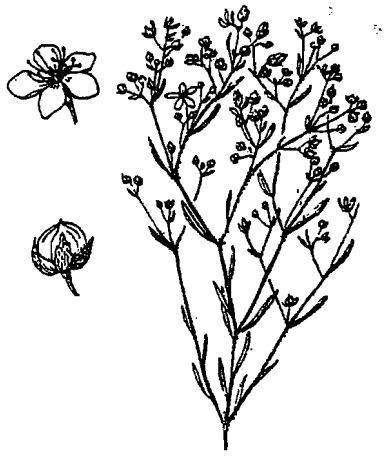
About 61 species of western North America and one of South America. The genus is particularly well represented in California, for 43 species (plus 23 lesser taxa) occur within the state, and 20 species (plus five lesser taxa) are endemic to the California Floristic Province.

1a. Plants without stems (or rarely with lateral stems less than 3 cm. long), thus the leaves are produced only in basal rosettes. Petals 8 to 18 mm. long. Floral tubes (between the ovary and the sepals & petals) slender and thread-like, and about 15 to 40 mm. long. . . . . ***C. graciliflora.***
1b. Plants with well developed stems (except sometimes in very young plants), the leaves cauline and sometimes in basal rosettes. Petals 1.5 to 9 mm. long. Floral tubes not like the above, the constriction between the ovary and the sepals & petals not discernible or less than 3 mm. long:
2a. Leaves narrowly linear and mostly less than 3 cm. long. Flowers or fruits never present in the basal nodes. Capsules roundish in cross-section; seeds shiny. . . . . ***C. strigulosa.***
2b. Leaves narrowly oblong to broadly ovate or oblanceolate, never narrowly linear, and often more or much more than 2 cm. long. Flowers and fruits often present in the basal nodes. Capsules four-sided in cross-section (at least when mature); seeds dull:
4a. Inflorescence with at least an understory of gland-tipped hairs:
5a. Plants most commonly with ascending to erect branches. Capsules .75 to .9 mm. wide at base. Upper-most leaves about as long as wide and strongly clasping the stem. . . . . ***C. hirtella.***
5b. Plants most commonly with a single erect stem. Capsules .9 to 2.2 mm. wide at base. Upper-most leaves longer than wide, and not or only scarcely clasping the stem. . . . . ***C. intermedia.***
4b. Inflorescence without gland-tipped hairs or only with a few remotely scattered gland-tipped hairs:
6a. Branches erect or ascending. Petals 4 to 7 mm. long, and frequently with lobes or notches at the apex . . . . . ***C. luciae.***
6b. Branches semi-prostrate and sprawling (or rarely with a single erect stem). Petals 1.5 to 3.5 (-4) mm. long, and without lobes or notches at the apex. . . . . ***C. micrantha.***

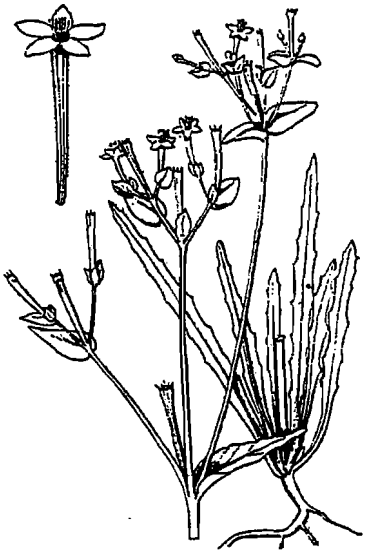
Camissonia graciliflora (Hooker & Arnott) Raven [*Oenothera g.* H. & A.]. HILL SUN-CUP (p. 123). *HABIT*: small annual herbs without stems or branches, or rarely with short horizontal branches less than 3 cm. long. *LEAVES*: produced in basal tufts, mostly linear to narrowly oblanceolate with entire or nearly entire margins, and about 2 to 10 cm. long. *INFLORESCENCE*: flowers are produced in the axils of the leaves, with the ovaries producing very slender and erect floral tubes about 1.5 to 4 cm. long. *COROLLA*: four petals about 8 to 14 (-18) mm. long; the petals are at first yellow, but turn reddish or greenish with age. *FRUIT*: a four-winged capsule about 4 to 8 mm. long. *OCCURRENCE*: very lightly scattered (only three plants were seen) on a steep southfacing grassland slope along the Pine Ridge Trail, between China Camp and the Church Creek Divide. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, and western Transverse Ranges, from southwestern Oregon to northern Los Angeles Co., with a remote population in northern Baja California (about 175 miles south of the border). ⊛March-May.

Camissonia hirtella (Greene) Raven [*Oenothera h.* Greene, *O. micrantha* var. *jonesii* (Leveille) Munz, *O. m.* var. *h.* (Greene) Jepson]. HIRSUTE SUN-CUP (p. 123). *HABIT*: annual herbs with one to several ascending or erect stems ranging from about .5 to 6 dm. (2-24") long. *LEAVES*: the lower-most commonly in loose rosettes and the cauline generally alternate, about .5 to 8 cm. long and with crisped margins, the lower larger, petiolate, and with oblong to oblanceolate blades, the mid-cauline sessile and typically broadly lanceolate to narrowly ovate, the upper-most generally ovate to broadly ovate and with clasping bases. *INFLORESCENCE*: the flowers are produced singularly in the axils of the leaves. *COROLLA*: four petals ranging from about 2 to 9 mm. long; the petals are at first yellow but turn red with age. *FRUIT*: a slender, twisted capsule about 1 to 2 cm. long. *OCCURRENCE*: widely scattered in chaparral openings in the Tassajara region, particularly in disturbed areas, such as in gullies or washes, on loose-soiled slopes where the soil tends to regularly shift downward, at landslides, and sometimes along trails that have been recently cleared. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Trinity and El Dorado Counties to northern Baja California. *NOTE*: A. D. E. Elmer's "Tassajara Hot Springs" specimen of June, 1901 (Elmer #3192 DS, isotype US) served as the type specimen for A. Nelson's *Sphaerostigma arenicola* (Raven '69). ⊛April-July.

Camissonia intermedia Raven [*Oenothera fruticetorum* J. T. Howell] (p. 123). *HABIT*: annual herbs commonly with one but sometimes two or several erect stems ranging from about 1 to 6 dm. (4-24") tall. The lower portions of the stem(s) tend to develop a shiny and deciduous epidermis with age. *LEAVES*: generally alternate and mostly about 1 to 6 cm. long, the lower larger, petiolate, and with narrowly oblong to oblanceolate blades, the upper sessile and generally with narrowly ovate to lanceolate blades. *INFLORESCENCE*: the flowers are produced singularly in the axils of the leaves. *COROLLA*: four petals about 1.5 to 3.5 mm. long; the petals are at first yellow, but turn red with age. *FRUIT*: a curving to coiling capsule about 2 to 3 cm. long. *OCCURRENCE*: lightly scattered in the Tassajara region, mostly in openings or disturbed areas in chaparral. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Lake Co. to northern Baja California. *NOTE*: according to Raven ('69), this taxon was probably derived from genetic interchange between *C. hirtella* and *C. micrantha*. ⊛May-July.

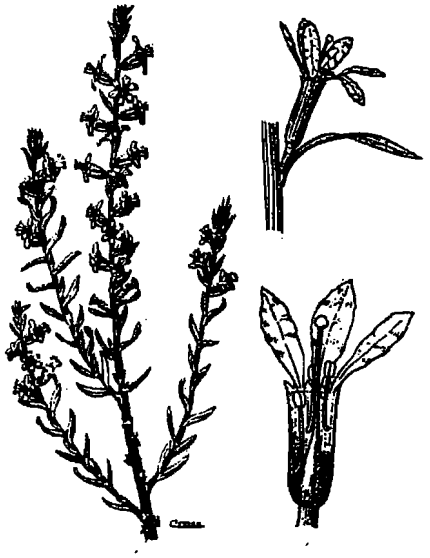


Hesperolinon micranthum



Mentzelia dispersa

Mentzelia micrantha



Lythrum californicum

Fraxinus dipetala

Camissonia graciliflora

Camissonia hirtella

Camissonia intermedia

Camissonia luciae

Camissonia luciae Raven. SANTA LUCIA SUN-CUP (p. 123). *HABIT*: annual herbs with one to several erect or ascending stems ranging from about .8 to 4 dm. (3-16") tall. *LEAVES*: the basal commonly in loose rosettes and the cauline generally alternate, about 1 to 8 cm. long, the lower larger and tending to be long-petiolate with narrowly oblanceolate blades, the upper short-petiolate to sessile and with oblong to narrowly lanceolate blades. The leaves are often reddish-tinged, especially below. *INFLORESCENCE*: the flowers are produced singularly in the axils of the leaves. *COROLLA*: four entire or notched petals about 4 to 7 mm. long. The petals are at first yellow but turn red with age, and commonly have one red dot near the base. *FRUIT*: a curving to coiling four-sided capsule about 1 to 2.5 cm. long. *OCCURRENCE*: widely scattered and locally common on grassland slopes and in openings in chaparral in the Tassajara region, especially on steep and clayey-soiled areas along the Church Creek Fault (such as in the Horse Pasture). *DISTRIBUTION*: mostly in the Santa Lucia Mts. of Monterey and San Luis Obispo Counties, but extending eastward to the mountains of San Benito Co. and southward to the Santa Ynez Mts. of Santa Barbara Co. *NOTE*: the majority of the specimens cited by Raven ('69) were from the upper watersheds of the Carmel River (Jamesburg, Hastings, Ventana Double-Cone, etc.) to the upper watershed of the Arroyo Seco River at The Indians (the type locality). ⊛April-July.

Camissonia micrantha (Homemann ex Sprengel) Raven. SMALL-FLOWERED SUN-CUP (p. 126). *HABIT*: annual herbs usually with several sprawling and semi-prostrate branches (or rarely with a single branch) ranging from about 1 to 6 dm. (4-24") long. *LEAVES*: the basal forming loose rosettes and the cauline generally alternate, about 1 to 12 cm. long and with linear-lanceolate to narrowly oblanceolate blades, the lower petiolate and the upper gradually becoming both reduced and sessile. *INFLORESCENCE*: the flowers are produced singularly in the axils of the leaves. *COROLLA*: four yellow petals about 1.5 to 4.5 mm. long. *FRUIT*: a narrow and curved or coiled capsule about 1.5 to 2.5 cm. long. *OCCURRENCE*: apparently widely scattered in the Tassajara region, but rare and restricted to areas where the soil is loose and/or sandy, such as in washes or gullies, or in other generally disturbed areas. *DISTRIBUTION*: Coast Ranges and coastal southern California, from Sonoma Co. to the northern edge of San Diego Co., and on Santa Miguel, Santa Rosa, Santa Cruz, and Santa Catalina Islands. ⊛April-July.

Camissonia strigulosa (Fischer & Meyer) Raven [*Oenothera s.* (F. & M.) Torrey & Gray, *O. contorta* Douglas var. *s.* (F. & M.) Munz] (p. 126). *HABIT*: annual herbs with very slender and ascending or decumbent stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: about 8 to 35 mm. long, the lower generally opposite and the upper mostly alternate, short petiolate to nearly sessile, the blades narrowly linear to very narrowly elliptic, and usually with remote serrulate teeth on the margins. *INFLORESCENCE*: the flowers are small and produced in the axils of the upper leaves. *COROLLA*: four petals ranging from about 2.1 to 4.2 mm. long; the petals are at first yellow, but turn red or reddish with age. *FRUIT*: a narrowly linear capsule about 1.5 to 4.5 mm. long. *OCCURRENCE*: scattered in open and sandy soiled areas, such as along the floodplains of Tassajara Creek (were locally abundant in small patches), and occasionally on southfacing and more or less grassy slopes. *DISTRIBUTION*: Coast Ranges, southern Sierra Nevada, Transverse and Peninsular Ranges, from Sonoma and Kern Counties to northern Baja California. Also on Santa Rosa Island. *NOTE*: some of the plants of this region with minute spreading hairs on the stems and leaves (as opposed to minute strigulose hairs to nearly glabrous) may represent morphologically very similar *C. contorta*. According to Raven ('69) the distinction between the taxa based on the nature of pubescence is consistent where the species overlap in the southern Sierra Nevada, but it does not always hold true where the species overlap in the Coast Ranges (Sonoma Co. to San Luis Obispo Co.). The only characteristics by which the taxa can be clearly distinguished are not readily observable: the pollen grains (often more than 30% four-pored in *C. contorta* and rarely more than 10% four-pored in *C. strigulosa*) and chromosome count (*C. contorta*: n=21; *C. strigulosa*: n=14). ⊛April-June.

CLARKIA. FAREWELL TO SPRING.

About 41 species of western North America. The genus is primarily Californian, for 39 species (plus 19 lesser taxa) occur within the state, and 34 (plus 17 lesser taxa) are endemic to the California Floristic Province. The common name "Farewell to Spring" refers to the relatively late flowering season of most *Clarkia* species, typically from May to early July.

1a. Petals constricted at the base into a definite, conspicuous claw (a narrow, stem-like base), and are thus more or less spade-shaped:
2a. Claw with two small opposing marginal lobes. Petals 6-12 mm. long. . . . . ***C. rhomboidea.***
2b. Claw with entire margins. Petals 10 to 20 mm. long. . . . . ***C. unguiculata.***
1b. Petal without claws or with very short, obscure claws, and mostly fan-shaped to elliptic:
3a. Upper rachis (axis) of inflorescence deflexed (turned downward), becoming straight as the buds mature:
4a. Petals broadly fan-shaped. Immature capsules four-grooved. . . . . ***C. lewisii.***
4b. Petals elliptic to obovate, widest near or above the middle, and more or less tapering to the apex. Immature capsules eight-grooved or ribbed. . . . . ***C. modesta.***
3b. Rachis of inflorescence erect. Buds erect or deflexed:
5a. Petals mostly pale rose-pink or lavender, with a distinct reddish to purplish spot:
6a. Petals with a wedge-shaped spot starting near the center, widening but fading towards upper margin. . . . . ***C. purpurea.***
6b. Petals with a semi-circular, uniform or streaked spot in lower center. . . . . ***C. speciosa.***
5b. Petals mostly or uniformly dark reddish-purple, without a distinct spot:
7a. Petals mostly dark, although some gradation of pigment is evident. Capsule covered with upwardly appressed hairs. . . . ***C. speciosa.***
7b. Petals uniformly dark reddish-purple. Capsule covered with spreading hairs. . . . . ***C. purpurea.***

Clarkia lewisii Raven & Parnell [*C. bottae* (Spach) Lewis & Lewis & *Godetia b.* Spach misapplied]. MONTEREY CLARKIA, HILL CLARKIA (p. 126). *HABIT*: showy-flowered annual herbs with erect stems ranging from about 2 to 5 dm. (8-20") tall. *LEAVES*: mostly alternate and narrowed at the base into petioles as much as 7 mm. long, the blades (of the local plants) narrowly linear to narrowly oblanceolate, about 1 to 4 cm. long, and usually with remotely toothed margins. *INFLORESCENCE*: the flowers are singular in the axils of the upper leaves. *COROLLA*: four generally fan shaped petals about 1 to 3 cm. long. Petal coloration is variable, but the petals of most of the plants in this region are basically pink or pinkish, with darker reddish streaks or flecks in the lower central area, and with a dark latitudinal band near the base, which, collectively, form a definite square shape at the inner base of the corolla. *FRUIT*: a slender and four-angled capsule about 2 to 4 cm. long. *OCCURRENCE*: widely scattered in open and generally grassy habitats in the Tassajara region, and locally common to

abundant in small colonies. *Distribution*: mostly in Santa Lucia Mts. of Monterey Co., inclusive of the Monterey Peninsula and the Sierra de Salinas, but also scattered in the Gavilan Mts. of northeastern Monterey Co. and western San Benito Co. *Note*: interior popu-lations of this species, such as in the Tassajara region, tend to have narrower leaves and a more open habit of growth than coastal popu-lations, and thus strongly resemble the closely related *C. cylindrica* (the accompanying illustration is actually of *C. cylindrica*). The key distinction between *C. lewisii* and *C. cylindrica* is the hypanthium, which is 3 mm. or less in length and with a ring of hairs on the upper margin in *C. lewisii* (both of these traits are clearly evident in the local plants), as opposed to 3 mm. or longer and with the ring of hairs below the upper margin in *C. cylindrica*. ⊛May-July.

Clarkia modesta Jepson. Modest Clarkia (p. 126). *Habit*: delicate annual herbs with slender and erect stems ranging from about 2 to 7 dm. (8-28") tall. *Leaves*: mostly alternate, the petioles about 2 to 15 mm. long, the blades narrowly linear to oblong-lanceolate or elliptic, usually with remotely toothed margins, and about 2 to 4 cm. long. *Inflorescence*: flowers are produced singularly in terminal racemes, the rachis of which is at first reflexed but becomes erect as the buds mature. *Corolla*: four rhomboid-elliptical to obovate petals about 8 to 12 mm. long and 3 to 7 mm. wide; the petals are usually pink distally and fading to nearly white towards the base. *Fruit*: a narrow and four-sided capsule about 1.5 to 3 cm. long. *Occurrence*: widely scattered in the Tassajara region, but generally uncommon, and usually found in small groups occurring in grassy openings within woodlands and chaparral. *Distribution*: Coast Ranges and western Transverse Ranges, from Tehama Co. to Santa Barbara Co., and the Sierra Nevada Foothills, from Stanislaus Co. to Tulare Co. ⊛April-May.

Clarkia purpurea (Curtis) Nelson & Macbride subsp. **quadrivulnera** (Douglas) Lewis & Lewis [*Godetia q.* (Douglas) Spach]. Four-Spot Clarkia (p. 126). *Habit*: erect annual herbs with slender stems ranging from about 1 to 5 dm. (4-20") tall. *Leaves*: alternate and opposite, linear to narrowly oblong-lanceolate with entire margins, and about 1.5 to 5 cm. long. *Inflorescence*: flowers are showy and produced in the axils of the upper leaves. *Corolla*: four generally fan-shaped petals which are extremely variable in size and coloration, for this taxon includes numerous self-pollinating races (Lewis & Lewis, '55). The majority of the plants of the Tassajara Region represent the most common and widespread form of this taxon, with petals more than 1 cm. long and basically light rose-pink with a darker wedge-shaped spot in the upper center; the spot fade as it nears the upper margin. The names "four-spot" and *quadrivulnera* are in reference to this trait. Also common in this region are plants with uniformly deep reddish-purple petals more than 1 cm. long, as well as plants with uniformly deep reddish-purple petals ranging from about 4 to 7 mm. long. Such plants probably represent more or less self-pollinating local races. *Fruit*: an eight-ribbed capsule about 1 to 3 cm. long. In general, the capsules of the local plants with dark petals are covered with dense, spreading hairs, while the capsules of light-petaled plants are usually covered with short, upwardly appressed hairs. *Occurrence*: as a whole, this is the most common *Clarkia* in the Tassajara region, and is widespread and locally abundant in open, grassy habitats. *Distribution*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Washington to northern Baja California. Also in the mountains of central Arizona. ⊛May-June.

Clarkia rhomboidea Douglas. Mountain Clarkia, Diamond Clarkia (p. 126). *Habit*: erect annual herbs with simple or branched stems ranging from about 1 to 10 dm. (4-40") tall. *Leaves*: mostly subopposite, the petioles about 5 to 20 mm. long, the blades lance-ovate to ovate-oblong or elliptic, entire or nearly so, and about 2 to 7 cm. long. *Inflorescence*: the flowers are produced singularly in terminal racemes, the axis of which is at first nodding but becomes erect as the buds mature. *Corolla*: four pinkish-lavender and often darker flecked petals about 6 to 12 mm. long. The petals have short claws with two opposing lobes and generally rhombic to deltoid limbs. *Fruit*: a four-angled and many-seeded capsule about 1 to 2.5 cm. long. *Occurrence*: lightly scattered along the summit of Black Butte, along the Pine Ridge Trail between China Camp and the Church Creek Divide, and perhaps at higher elevations elsewhere in the Tassajara region. *Distribution*: widespread in the mountains of western North America, from Washington and Montana to northern Baja California and Arizona, and occurring mostly between 3,000 and 8,000 ft. ⊛May-July.

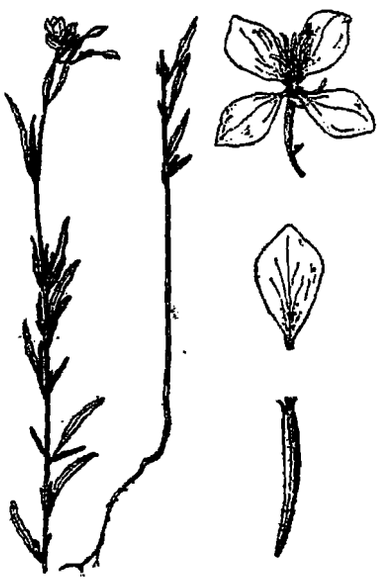
Clarkia speciosa Lewis & Lewis [*Godetia parviflora* Jepson]. Beautiful Clarkia, Rose Clarkia (p. 126). *Habit*: showy-flowered annual herbs with erect or ascending stems ranging from about 1-6 dm. (4-24") tall. *Leaves*: alternate, sessile or on petioles less than 5 mm. long, the blades narrowly linear to narrowly lanceolate, entire or nearly so, and about 1 to 6 cm. long. *Inflorescence*: the flowers are singular in the axils of the middle and upper leaves. *Corolla*: four generally fan-shaped petals ranging from about 1 to 3 cm. long. The petals exhibit a variety of colors and patterns. Common in this region are plants with rose-pink petals which are with a darker and semi-circular spot in the lower center, the spot comprised of streaks and flecks. Also common are plants which have dark reddish-purple petals which are usually streaked towards the base, but without an evident central spot. The petals of such plants correspond to what is said to be the most typical coloration pattern in the Santa Lucia Mts. (Lewis & Lewis, '55). Plants in the lower regions of the Tassajara canyon, towards the Arroyo Seco River, tend to have exceptionally large petals which are mostly a brilliant deep blood-red, but with slightly faded upper margins. *Fruit:* a narrow four sided capsule about 1 to 2.5 cm. long. *Occurrence:* widely scattered and locally common to abundant at lower to intermediate elevations in the Tassajara region, and occurring mostly in open and generally grassy habitats. *Distribution*: Coast Ranges, from Monterey and San Benito Counties to Santa Barbara Co., but mostly in the Santa Lucia Mts. of Monterey and San Luis Obispo Counties. ⊛May-July.

Clarkia unguiculata Lindley [*C. elegans* Douglas]. Elegant Clarkia, Canyon Clarkia (p. 126). *Habit:* annual herbs with erect to decumbent stems ranging from about 3 to 10 dm. (12-40") long. *Leaves*: alternate, the petioles 3 to 10 mm. long, the blades about 1 to 6 cm. long, lanceolate to elliptic (or ovate), often reddish-tinged, and with entire or toothed margins. *Inflorescence*: the flowers are produced singularly in terminal racemes. The buds, which are covered with bright purplish-red hair, are at first deflexed, but turn outward or upward as the flowers open. *Corolla*: four lavender-pink to dark reddish-purple petals about 1 to 2.5 cm. long. The petals are quite distinctive, for they spread outward on long and relatively slender petiole-like claws, then flare into broad and deltoid to rhombic blade-like limbs. *Fruit*: a many seeded capsule about 1.5 to 3 cm. long. *Occurrence*: widely scattered and locally common in the Tassajara region, primarily in open or semi-open and grassy areas within woodlands, and also fairly common, although usually in a more depauperate form, in openings in chaparral. *Distribution*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Lake and Plumas Counties to San Diego Co. ⊛ May-June.

Camissonia micrantha

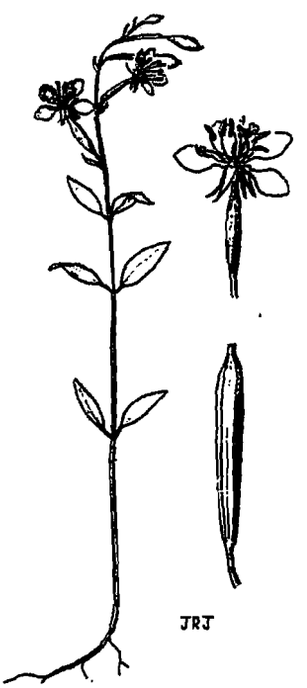
Camissonia strigulosa

Clarkia lewisii



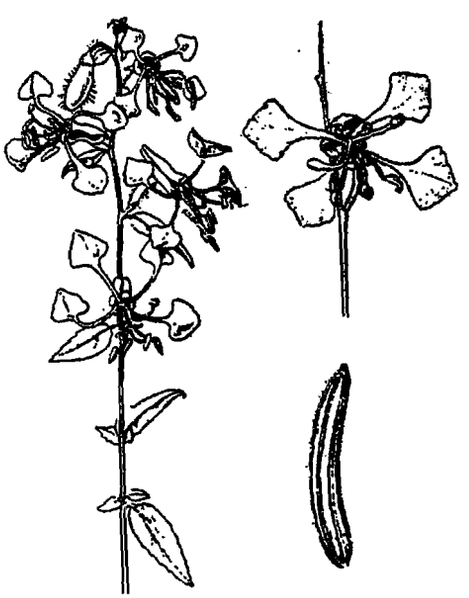
Clarkia modesta

Clarkia purpurea quadrivulnera



Clarkia rhomboidea

Clarkia speciosa



Clarkia unguiculata

Epilobium brachycarpum

EPILOBIUM. WILLOW-HERB, COTTON-WEED, ZAUSCHNERIA, FIRE-WEED.

About 170 species of annual and perennial herbs or subshrubs primarily of temperate regions.

1a. Tufted evergreen perennials, often becoming semi-woody at the base with age. Flowers with elongated corolla-like floral tubes about 2 to 4 cm. long. Petals and floral tube scarlet-red. . . . . ***E. canum.***

1b. Annual or perennial herbs, never woody. Flowers without floral tubes or with tubes less than 3 mm. long. Petals pink to purplish or sometimes nearly white:

2a. Plants of wet or moist riparian habitats. Leaves narrowly lanceolate to rather broadly oblong-lanceolate or elliptic:

3a. Plants perennial. Leaves opposite up to inflorescence. Epidermis not peeling. Seeds with tufts of hairs at the apex. . . . ***E. ciliatum.***

3b. Plants annual. Leaves opposite only near base. Epidermis of lower stems peeling. Seeds without tufts of hairs. . . . ***E. densiflorum.***

2b. Plants of dry habitats (or only incidentally occurring in wet or moist habitats). Leaves narrowly linear to narrowly lance-linear, elliptic or oblanceolate:

4a. Plants glandular and more to much more than 2 dm. tall. Hypanthium 1.5 to 16 mm. long, sepals 2 to 8 mm. long. . . ***E. brachycarpum.***

4b. Plants not glandular and mostly about 1 to 3 dm. tall. Hypanthium .4 to 1 mm. long, sepals 1.5 to 4 mm. long. . . . . ***E. minutum.***

Epilobium brachycarpum Presl [*E. paniculatum* Nuttall ex Torrey & Gray]. SUMMER COTTONWEED (p. 126). *HABIT*: xerophytic annual herbs with erect stems ranging from about 2 to 12 dm. (8-48") tall. *LEAVES*: mostly alternate and short-petioled, the blades linear to lance-linear with remote teeth on the margins, and about 2 to 5 cm. long. The leaves are often shed rather early. *INFLORESCENCE*: the flowers are produced on the slender branches of open panicles. *COROLLA*: four pinkish-lavender to nearly white petals about 3 to 6 cm. long; the petals are notched at the apex. *FRUIT*: narrow capsules about 2 to 3 cm. long containing numerous comose seeds. *OCCURRENCE*: widely scattered in open habitats in the Tassajara region, and often in disturbed areas, such as on landslides or in washes. *DISTRIBUTION*: western North America, from British Columbia and South Dakota to northern Baja California and New Mexico. *NOTE*: although this species has become an aggressive weed in and about developed areas of California, such as along roads or in vacant lots, and even in cracks in streets and sidewalks, the plants of this region behave as balanced members of the native flora. ⊛June-Oct.

Epilobium canum (Greene) Raven [*Zauschneria cana* Greene]. HUMMINGBIRD'S TRUMPET, CALIFORNIA FUCHSIA, MEXICAN BALSAMEA, ZAUSCHNERIA (p. 128). *HABIT*: highly variable evergreen perennial herbs, usually tufted and often becoming woody at the base with age, with erect or ascending branches ranging from about 3 to 9 dm. (1-3') long. *LEAVES:* largely opposite, at least below, nearly sessile, and varying greatly in shape, size, and degree of hairiness. Smaller leaves are usually clustered in the axils of the primary leaves. *INFLORESCENCE*: the flowers are showy and produced in few-flowered terminal and later-al spikes. *COROLLA*: four notched petals about 8 to 16 mm. long. Both the petals and much more conspicuous corolla-like floral-tubes (which are about 2 to 4 cm. long) are scarlet-red. The floral-tubes have globose bases containing a highly nutritious nectar, which is a reward for hummingbirds, the pollinators of this species. *FRUIT*: slender capsules about 2 to 3.5 cm. long containing numerous comose seeds. *OCCURRENCE*: widespread at lower to intermediate elevations of the Tassajara region, and locally common to abundant in open and often rocky areas. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Sonoma and Lake Counties to northern Baja California. *NOTE*: this is a very complex species recognized by Raven ('76) as being comprised of six subspecies which integrate to such an extent that separating them is very difficult to impossible. While plants corresponding to the descriptions of three of the subspecies occur in the Tassajara region, most of the local plants exhibit morphological features which are intermediate between these subspecies. Plants with short and narrow leaves (usually less than 1 cm. long and 2 mm. wide) with entire and often revolute margins, and with flowers which are mostly less than 3 cm. long, represent *E. c.* subsp. ***canum*** (Greene) Raven [*Zauschneria cana* Greene]. Plants with densely tomentose-canescent leaves which are linear to lanceolate, usually entire, and up to 2 cm. long and 2.5 to 3.5 mm. wide, and with flowers which are mostly more than 3 cm. long, represent *E. c.* subsp. ***angustifolium*** (Keck) Raven [*Zauschneria californica* subsp. *angustifolia* Keck, *Z. californica* Presl]. Plants with green to gray-pilose leaves which are lanceolate to linear-lanceolate or oblong-lanceolate, usually with remotely toothed margins, the largest up to 4 cm. long and 3 to 9 mm. wide, and with flowers mostly more than 3 cm. long, represent *E. c.* subsp. ***mexicanum*** (Presl) Raven [*Zauschneria californica* subsp. *mexicana* (Presl) Raven, *Z. mexicana* (Presl) Raven]. ⊛July-Oct. (or to the first rains or frosts).

Epilobium ciliatum Rafinesque [*E. adenocaulon* Hausskneckt, *E. californicum* Hausskneckt]. WILLOW-HERB (p. 128). *HABIT*: perennial herbs with erect stems ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: the lower opposite and the upper-most alternate, the petioles about 2 to 8 mm. long, the blades rather delicate and clammy to the touch, lanceolate to oblong-lanceolate with finely toothed margins, and about 2 to 8 cm. long. *INFLORESCENCE*: flowers are produced in the axils of the upper leaves, and the long and narrow ovaries resemble pedicels. *COROLLA*: four notched petals about 2 to 6 mm. long, ranging from lavender to rose or pink, or are sometimes nearly white. *FRUIT*: narrow capsules about 5 to 7 cm. long containing numerous comose seeds. *OCCURRENCE*: widely scattered and fairly common along streams and in other moist or seasonally moist habitats in the Tassajara region. *DISTRIBUTION*: throughout most of temperate and subarctic North America. ⊛May-Oct.

Epilobium densiflorum (Lindley) P. Hoch & Raven [*Boisduvalia densiflora* (Lindley) Watson]. LEAFY WILLOW-HERB (p. 128). *HABIT*: erect annual herbs with simple or branched stems ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: nearly sessile, the blades lance-linear to lanceolate with entire to denticulate margins, and about 2 to 5 cm. long. The lower-most leaves are opposite while the rest are alternate. *INFLORESCENCE*: the flowers are axillary in leafy terminal spikes. *COROLLA*: four deeply two-lobed and rose-purple or sometimes whitish petals about 4 to 10 mm. long. *FRUIT*: a cylindric capsule about 6 to 10 mm. long. *OCCURRENCE*: lightly scattered in the bed of the Arroyo Seco River in the vicinity of the confluence of Tassajara Creek, and scattered along brooks in Pine Valley. *DISTRIBUTION*: widely distributed in western North America, from British Columbia and Montana to the mountains of northern Baja California. ⊛May-August.

Epilobium minutum Lehmann [*E. m.* Lindley ex Hooker]. SMALL COTTONWEED (p. 128). *HABIT*: simple or branched annual herbs ranging from about .5 to 3 dm. (2-12") tall. *LEAVES*: mostly opposite and on petioles about 1 to 10 mm. long, the blades oblong-linear to oblanceolate or lanceolate with entire or remotely toothed margins, and about 1 to 2 cm. long. *INFLORESCENCE*: the flowers are produced in the axils of the upper leaves. *COROLLA*: four two-lobed petals about 2 to 4 mm. long, that vary from rose-lavender to white. *FRUIT*: a narrow capsule 1.5 to 2.5 cm. long. *OCCURRENCE*: scattered in open or shady habitats in Pine Valley, along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, and on Chew's Ridge. *DISTRIBUTION*: from British Columbia and Montana to California, extending southward to Santa Barbara Co. in the Coast Ranges, and to Madera Co. in Sierra Nevada Foothills. ⊛April-August.

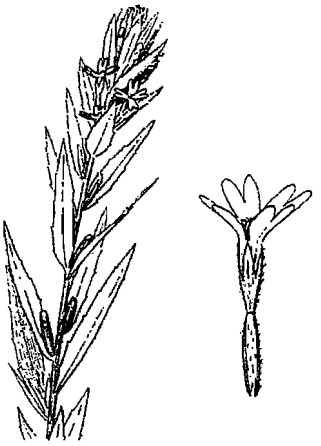
subsp. canum

subsp. mexicanum

subsp. angustifolium

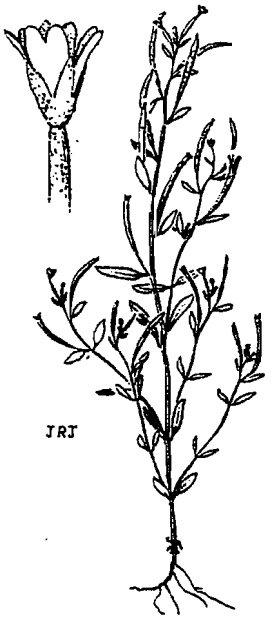
Epilobium canum

Epilobium ciliatum

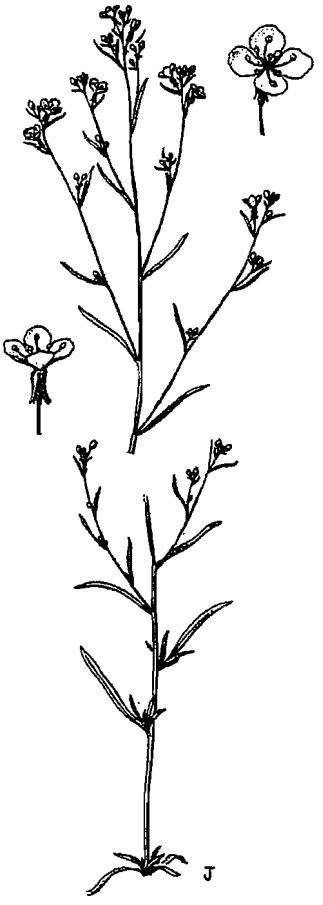


Epilobium densiflorum

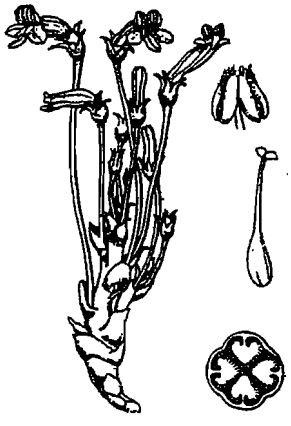
Orobanche bulbosa



Epilobium minutum

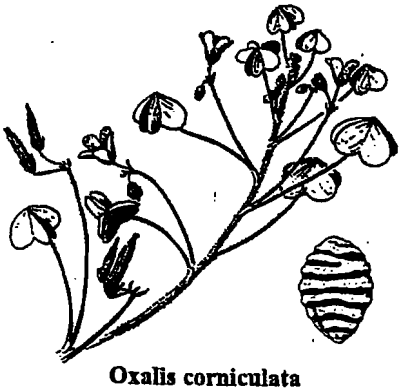


Gayophytum heterozygum



Orobanche fasciculata

Orobanche uniflora



Oxalis corniculata

GAYOPHYTUM.

Nine species of generally montane annual herbs of temperate western North America and South America.

Gayophytum heterozygum Lewis & Szweykowski [*G. diffusum* var. *villosum* Munz] (p. 128). *Habit*: annual herbs with slender, erect and upwardly branched stems ranging from about 1.5 to 8 dm. (6-32") tall. *Leaves*: alternate, sessile or narrowed to short petioles, the blades narrowly linear to linear-oblong with entire margins, about 1.5 to 6 cm. long, and diminishing in size upward on the stems. *Inflorescence*: the flowers are small and produced in the axils of the upper leaves. *Corolla*: four petals about 2 to 4 mm. long; the petals are at first white, but become pinkish or reddish with age. *Fruit*: a narrow capsule about 6 to 15 mm. long. *Occurrence*: lightly scattered at higher elevations in the Tassajara region, such as on Chew's Ridge and along the Pine Ridge Trail from Tassajara Rd. to Pine Ridge, and occurring mostly in opening in woodlands and chaparral, and sometimes in disturbed areas, such as on steep banks along Tassajara Rd. *Distribution*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Washington to San Diego Co., mostly in montane coniferous forests between 2,600 and 9,800 ft. ⊛May-Oct.

Notes on *Onagraceae*.

A. D. E. Elmer's "Tassajara Hot Springs" specimen of *Gayophytum humile* (Elmer #3188 DS, June 1901) was collected, according to a note enclosed in an envelope pasted to the sheet, "near Indian Valley" (about 5½ linear miles southwest of Tassajara Hot Springs). *G. humile* is a montane species that typically occurs in coniferous forests where water or snow stands during winter and spring months. The populations in the Santa Lucia Mts. (Indian Valley and Hanging Valley) are greatly disjunct from the nearest populations of this species.

One of Junea Kelly's "Tassajara Springs" specimens of 1917 (at CAS) represented *Clarkia amoena*. This is a coastal species which is not known to occur south of Marin Co.; Kelly's specimen was noted by Raven as "doubtless of garden origin" (Howitt & Howell '64).

Plants appearing to represent *Oenothera elata* subsp. *hookeri* (*O. hookeri*) are scattered along Camp Creek in the vicinity of the crossing of the Marble Peak Trail. The plants were not in flower or fruit at the time of observation.

Onagraceae species reported in areas of the Santa Lucia Mts. near or relatively near the Tassajara region include: *Camissonia boothii* subsp. *decorticans*, *Camissonia campestris*, *Clarkia epilobioides*, *Clarkia similis*, *Epilobium ciliatum* subsp. *watsonii*, and *Epilobium torreyi* (*Boisduvalia stricta*).

OROBANCHACEAE. Broom-Rape Family.

About 14 genera and 180 to 200 species primarily of northern temperate regions. All are root parasites.

OROBANCHE. Broom-Rape, Cancer-Root.

A widely distributed genus of about 140 species; the genus is particularly well represented in the Mediterranean region.

1a. Plants dark purplish-brown to black. Flowers sessile or nearly so, subtended by bracts, and congested on the short branches of a dense and more or less conically-shaped panicle terminating a single stout stem. . . . . ***O. bulbosa.***

1b. Plants yellowish or bluish-purple. Flowers produced on long pedicels, and not subtended by bracts:

2a. Plants pale straw-yellow. Flowers several to many from the branches of a frequently emerged caudex. . . . . ***O. fasciculata.***

2b. Plants purple or bluish purple. Flowers mostly singular on long pedicels rising from a subterranean caudex. . . . . ***O. uniflora.***

Orobanche bulbosa (Gray) Beck [*O. tuberosa* (Gray) Heller]. Chaparral Broom-Rape (p. 128). *Habit*: rather exotic dark purplish-brown to black parasitic herbs with a single thick stem ranging from about 8 to 30 cm. long. The exposed portion of the stem is usually only about 25 to 50 percent of the length. *Leaves*: none, although the floral bracts may be mistaken for leaves. *Inflorescence*: the flowers are sessile or nearly sessile and congested on the branches of a dense and more or less conically-shaped terminal panicle. *Corolla*: bilabiate with spreading and acute lobes, dark purplish-brown to black externally and purplish to yellowish internally, and about 12 to 15 mm. long. *Fruit*: a two-valved capsule about 3 to 5 mm. long. *Occurrence*: widely scattered in chaparral in the Tassajara region, mostly on southfacing slopes dominated by *Adenostoma fasciculatum* (Chamise), its primary host, but generally uncommon. *Distribution*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Mendocino and El Dorado Counties to northern Baja California. Also on the Channel Islands. ⊛April-July.

Orobanche fasciculata Nuttall [*O. f.* var. *franciscana* Achey]. Clustered Broom-Rape (p. 128). *Habit*: pale-yellow or straw-colored parasitic herbs with few to many erect stems generally less than 12 cm. (4.75") long; the stems arise from a stout and often partially emerged caudex. The emergence of more robust plants, with numerous spreading offshoots, can create conspicuous ruptures in the ground. *Leaves*: none. *Inflorescence*: the flowers are produced on pedicels about 2 to 10 cm. long; the pedicels are both terminal and lateral on the stems. *Corolla*: bilabiate, pale-yellow with pale to dark purplish-brown lines, and about 15 to 30 mm. long. *Fruit*: a two-valved capsule about 4 to 8 mm. long. *Occurrence*: widely scattered in the Tassajara region, but generally uncommon. *Distribution*: western North America, from northwestern Canada and the central United States to northern Mexico. *Notes*: the plants of this region generally correspond to what Achey recognized as var. *franciscana*. The primary hosts in California are believed to be *Artemisia* (sagebrush), *Eriogonum* (wild buckwheat), and *Eriodictyon* (yerba santa). ⊛ April-July.

Orobanche uniflora Linnaeus [*O. u.* var. *purpurea* (Heller) Achey, *O. u.* var. *minuta* (Suksdorf) Achey, *O. u.* var. *sedi* (Suksdorf) Achey]. Naked Broom-Rape, One-Flowered Broom-Rape (p. 128). *Habit*: small and very inconspicuous parasitic herbs that produce one (to three) flowers which arise from the ground on erect pedicels no more than 12 cm. (4.75") tall. A substantial portion of the pedicel is usually below ground. *Leaves*: none. *Corolla*: bilabiate with small roundish lobes, about 1.5 to 2 cm. long, dark purple or bluish purple, and often with a yellow strip along the base of the throat. *Fruit*: a two-valved capsule less than 5 mm. long. *Occurrence*: scattered on shady woodland slopes in the Tassajara region, but apparently uncommon (this perception is likely due to the inconspicuousness of the plants in combination with the short duration of above-ground manifestation). All of the local plants that I have seen were growing in association with *Saxifraga californica*, a common host. *Distribution*:

widespread in North America, from Yukon to the eastern United States, and extending southward along the Pacific Slope to southern California. *Note*: the plants of this region correspond to the description of what Achey recognized as var. *purpurea*. Such plants occur from British Columbia and Idaho southward, through the Sierra Nevada and Coast Ranges, to the San Gabriel and San Bernardino Mts. of southern California. ⊕March-May.

Note on *Orobanche*.

A. D. E. Elmer's "Tassajara Hot Springs" specimen of *Orobanche californica* subsp. *jepsonii* (Elmer #3240 DS, 6/1901, cited by Heckard, '73, as *O. c.* subsp. *condensa*) was collected, according to a note enclosed in an envelope pasted to the sheet, in Lost Valley (about 5½ miles south of Tassajara Hot Springs).

OXALIDACEAE. OXALIS FAMILY.

Eight genera and about 575 species ranging from annual herbs to trees; the species are primarily of temperate regions. Although two *Oxalis* species are native to the Santa Lucia Mts. (*O. albicans* and *O. oregana*), both are restricted to coastal slopes and canyons.

***Oxalis corniculata** Linnaeus. YELLOW SORREL (p. 128). *Habit*: small perennial herbs with decumbent or trailing stems ranging from about .5 to 3 dm. (2-12") long. The stems frequently root at the nodes. *Leaves*: alternate and with petioles about 1 to 5 cm. long, the blades divided into three generally obcordate leaflets about 5 to 10 mm. long. *Inflorescence*: the flowers are produced mostly in two's or three's on axillary peduncles about 2 to 5 cm. long. *Corolla*: five yellow petals about 4 to 8 mm. long. *Fruit*: a linear capsule about 1 cm. long. *Occurrence*: for many years weedy in and about the developed area of Tassajara Hot Springs, and occasionally along Tassajara Creek, downstream from the hot springs. *Distribution*: a common weed in California; native to Europe. ⊕April-Oct.

Note: *Oxalis pes-caprae* (Bermuda Buttercup or Sourgrass), a bulbous perennial herb with long and leafless flowering stems, long-petiolate three-foliate leaves, and corollas comprised of five yellow petals about 15 to 25 mm. long, has for many years been weedy around the developed area of Tassajara Hot Springs.

PAPAVERACEAE. POPPY FAMILY.

About 40 genera and 400 species of annual and perennial herbs, shrubs and small trees primarily of temperate and subtropical regions of the Northern Hemisphere. The family is the source of many ornamentals, as well as the opium poppy, *Papaver somniferum*.

1a. Corollas asymmetrical. Petals four, the inner two connected at the apex, the outer two connected at the base. . . . . ***Dicentra***.
1b. Corollas symmetrical. Petals four or six and completely distinct:
2a. Petals six, white, and less than 5 mm. long. Leaves opposite or whorled and simple. . . . . ***Meconella***.
2b. Petals four, yellow to orange, and 5 to 50 mm. long. Leaves alternate or basal and simple or dissected into narrow segments:
3a. Shrubs or shrubby plants of chaparral habitats. Leaves simple. . . . . ***Dendromecon***.
3b. Herbaceous plants primarily of grassy habitats. Leaves dissected into narrow segments. . . . . ***Eschscholzia***.

DENDROMECON. TREE POPPY.

Two species of the California Floristic Province.

Dendromecon rigida Bentham. TREE POPPY (p. 132). *Habit*: lanky evergreen shrubs ranging from about 1 to 2.5 m. (3.3-8.2') tall. *Leaves*: alternate, the petioles about 2 to 8 mm. long, the blades relatively stiff, yellowish to grayish-green, linear-lanceolate to lance-oblong with minute scabrous teeth on the margins, and about 2 to 10 cm. long. *Inflorescence*: the showy flowers are produced singularly on pedicels about 3 to 9 cm. long. *Corolla*: four bright yellow petals about 2 to 3 cm. long. *Fruit*: a narrow and upwardly curving capsule about 5 to 10 cm. long. *Occurrence*: widely scattered in chaparral habitats in the Tassajara region, and rather common in some areas. *Distribution*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Sonoma and Shasta Counties to northern Baja California. ⊕May-July.

DICENTRA. BLEEDING HEARTS, EAR DROPS, STEER'S HEAD.

About 16 species of perennial herbs of North America and Asia. This and similar genera are commonly segregated as *Fumariaceae* (Fumitory Family).

Dicentra chrysantha (Hooker & Arnott) Walpers. GOLDEN EAR DROPS (p. 132). *Habit*: perennial herbs from stout roots which annually produce one to several erect or ascending branches ranging from about 6 to 18 dm. (2-6') tall. *Leaves*: alternate, about 10 to 30 cm. long, and irregularly bipinnately divided into narrow segments or lobes. *Inflorescence*: loosely to densely flowered terminal panicles about 2 to 5 dm. long. *Corolla*: four yellow petals, about 12 to 16 mm. long, that are produced in two dissimilar series. The two outer petals are united at the base and flare outward at the apex, while the two inner petals converge and unite at the apex. *Fruit*: a one-celled, two-valved capsule about 15 to 25 mm. long. *Occurrence*: widely scattered in the Tassajara region, mostly in chaparral or in rocky areas in woodlands, and locally common on the higher ridges. *Distribution*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Mendocino and Calaveras Counties to northern Baja California. ⊕April-Sept.

ESCHSCHOLZIA. GOLDEN POPPY.

Twelve species of annual and perennial herbs of western North America. The genus is especially well represented in California, for ten species occur within boundaries of the state, and six are endemic to the California Floristic Province.

1a. Flowers and capsules not subtended by a rim or with a rim less than .3 mm. wide. Petals .5 to 2.5 cm. long. . . . . ***E. caespitosa.***
1b. Flowers and capsules subtended by a thin and spreading rim about .5 to 5 mm. wide. Petals mostly 2 to 6 cm. long. . . . ***E. californica.***

Eschscholzia caespitosa Benthem. SLENDER CALIFORNIA POPPY (p. 132). *HABIT*: annual herbs with erect or ascending stems ranging from about 1 to 3 dm. (4-16") tall. *LEAVES*: mostly basal and with petioles about 1 to 7 cm. long, the blades about 1 to 3 cm. long and ternately divided into sections that are further dissected into small linear segments. *INFLORESCENCE*: the flowers are singular and terminal. *COROLLA*: four yellow and generally fan-shaped petals about 1 to 2.5 cm. long. *FRUIT*: a narrow capsule about 4 to 8 cm. long. *OCCURRENCE*: lightly scattered in open and usually grassy habitats in the Tassajara region, sometimes in association with *E. californica*, and apparently the only *Eschscholzia* species that naturally occurs in the immediate vicinity of Tassajara Hot Springs. *DISTRIBUTION*: widely scattered in northern and central California, and extending northward to southern Oregon and southward to Orange Co. *NOTE*: plants in the late stages of the flowering season (June-July) develop longer and more leafy stems, and produce smaller pale yellow petals mostly about 5 to 10 mm. long. Such plants can be misidentified as *E. hypecoides* of the inner south Coast Ranges. Based on personal observation and a review of herbarium specimens from this region which have been assigned to *E. hypecoides* (J.C. Clausen #888 CAS, Chew's Ridge, July 1934, and William Dudley DS, Tassajara, June 11, 1901), the plants of this region should be assigned to *E. caespitosa*, for the plants are glabrous (not sparsely pubescent) and the buds are erect (not nodding). Although A. D. E. Elmer's Tassajara Hot Springs specimen (Elmer #3268 DS, June 1901) was not seen, I suspect that it also represents *E. caespitosa* (Elmer's specimen served as the type for Greene's *E. elmeri*). ⊛March-July.

Eschscholzia californica Chamisso. CALIFORNIA POPPY (p. 132). *HABIT*: showy-flowered annual or short-lived perennial herbs with erect or ascending stems ranging from about 2 to 6 dm. (8-24") long. *LEAVES*: basal and cauline (the cauline alternate), the petioles about 2 to 12 cm. long, the blades about 2 to 8 cm. long and ternately divided into major divisions which are dissected into narrow segments. The upper-most leaves are much reduced in size. *INFLORESCENCE*: the flowers are singular and terminal on the stems and branches. *COROLLA*: four large and silky-textured petals about 2 to 6 cm. long. Flowers blooming in the spring months tend to have larger and deep orangish-yellow petals, while flowers blooming during the summer months tend to have smaller petals that are generally yellow. *FRUIT*: a narrow capsule about 3 to 9 cm. long. *OCCURRENCE*: widely scattered and locally common in open grassland habitats of the Tassajara region, such as in open meadows in the Church Creek area, along the Pine Ridge Trail between China Camp and the Church Creek Divide, in the Horse Pasture (on very steep slopes above the eastern side of the trail), and on alluvial benches above (and north) of Tassajara Creek toward the mouth of the Tassajara Canyon. Plants in the developed area of the hot springs are of garden origin. *DISTRIBUTION*: from southern Washing-ton to southern California. ⊛Feb.-Sept.

MECONELLA. LITTLE POPPY.

Four species of western North America. Three of the species are endemic to the California Floristic Province.

⇧**Meconella denticulata** Greene [*M. oregana* Nuttall var. *d.* (Greene) Jepson]. SMALL-FLOWERED MECONELLA (p. 132). *HABIT*: small and inconspicuous annual herbs with slender stems ranging from about 1 to 2 dm. (4-8") tall. *LEAVES*: about 1 to 4 cm. long, and varying in size and shape depending on the location on the plant. Basal leaves, which are produced in rosettes, typically have long petioles and ovate to obovate blades, the leaves at the lower and middle nodes vary from linear to oblong-oblanceolate or spatulate and are generally whorled in four's, while the upper-most leaves are opposite, sessile, and narrowly linear to oblanceolate. The margins are remotely toothed or entire. *INFLORESCENCE*: the flowers are terminal and axillary on filiform pedicels about 1 to 5 cm. long. *COROLLA*: six white petals about 2 to 4 mm. long. *FRUIT*: a narrowly linear and twisted capsule about 2 to 3 cm. long. *OCCURRENCE*: lightly scattered on shady woodland slopes in the Tassajara region, but inconspicuous and easily overlooked. *DISTRIBUTION*: Coast Ranges and coastal southern California, from Monterey Co. to San Diego Co. ⊛March-May.

Note on *Papaveraceae*.

Papaveraceae species reported from areas of the Santa Lucia Mts. near or relatively near to the Tassajara region include: ***Argemone munita, Meconella linearis, Papaver californicum, Platystemon californicus*** and ***Stylomecon heterophylla.***

PHILADELPHACEAE. MOCK-ORANGE FAMILY.

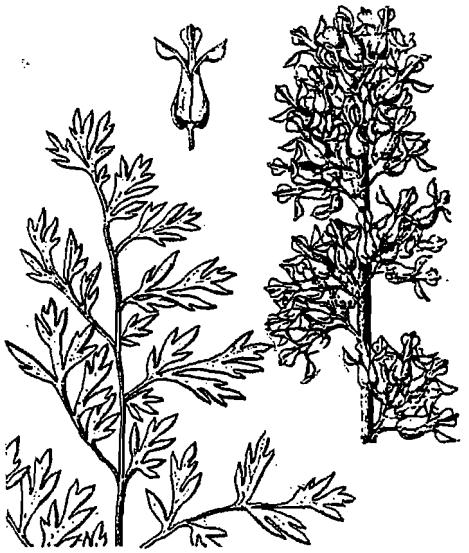
Seven genera and about 130 species of shrubs and subshrubs of temperate and subtropical regions of the northern hemisphere. Often included in *Saxifragaceae* (Saxifrage Family).

WHIPPLEA. MODESTY, YERBA DE SELVA.

One species of the Pacific Slope of temperate western North America.

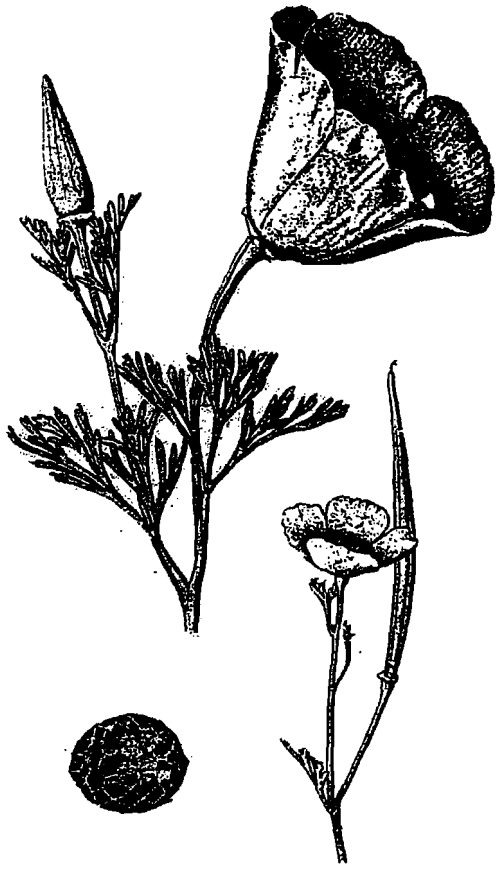
⇩**Whipplea modesta** Torrey (p. 132). *HABIT*: deciduous perennials with slender, trailing and slightly woody branches ranging from about 3 to 18 dm. (1-6') long. The branches frequently root at the nodes. *LEAVES*: opposite and nearly sessile, the blades mostly ovate and with a few shallow teeth on the margins, and about 1 to 3 cm. long. *INFLORESCENCE*: flowers are small and produced in terminal head-like clusters. *COROLLA*: four to six white petals about 2 to 2.5 mm. long. Fruit: a four to five celled capsule about 2 to 2.5 mm. wide. *OCCURRENCE*: occasional on moist and shady rock outcrops along Tassajara Creek above the confluence of Church Creek, and along the upper Carmel River (re. a DS specimen collected by William Dudley from a "bank of Carmel River above Ventana Creek" on June 21, 1901. This species may also be present in Miller's Canyon, Pine Valley and the in canyons of Church, Oryoki

Dendromecon rigida

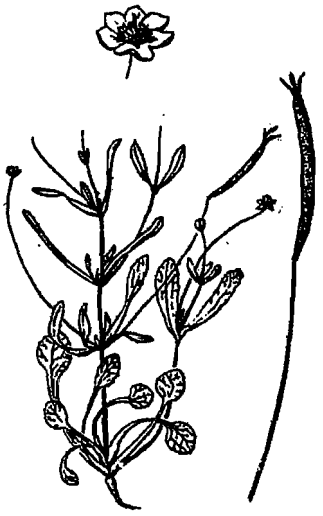


Dicentra chrysantha

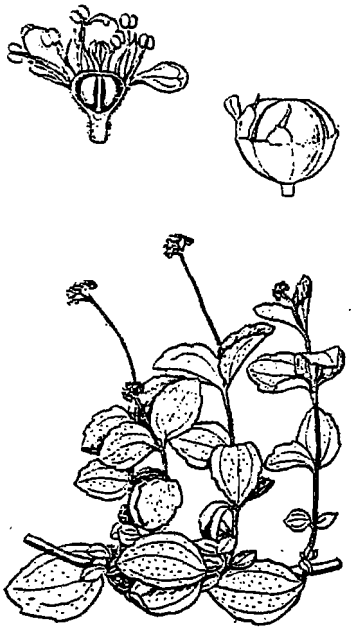
Eschscholzia caespitosa



Eschscholzia californica

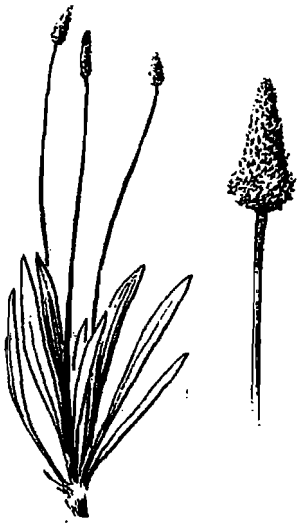


Meconella denticulata



Whipplea modesta

Plantago erecta



Plantago lanceolata

Willow Creeks, for suitable habitats exist in these areas. *Distribution*: from Washington southward, through the outer Coast Ranges, to the Santa Lucia Mountains of Monterey County. ⊛April-June.

PLANTAGINACEAE. Plantain Family.

Three genera and about 270 species of mostly temperate annual and perennial herbs.

PLANTAGO. Plantain.

A widely distributed genus of about 250 species of annual and perennial herbs.

1a. Annual herbs from a slender taproot. Leaves narrowly linear and grass-like, light-green, delicate, and inconspicuously veined. Outer sepals completely separate. Stamens not exserted. . . . . ***P. erecta.***

1b. Perennial herbs from a stout taproot. Leaves oblong-lanceolate, dark green, rather coarse, and strongly ribbed. Outer sepals united. Stamens exserted. . . . . ***P. lanceolata.***

Plantago erecta Morris [*P. hookeriana* Fischer & Meyer var. *californica* (Greene) Poe]. California Plantain (p. 132). *Habit*: small annual herbs with flowering stems ranging from about .5 to 2.5 dm. (2-10") tall. *Leaves*: strictly basal and erect or ascending in rosettes, linear to narrowly linear-lanceolate with entire or remotely toothed margins, and about 3 to 12 cm. long. *Inflorescence*: flowers are small and produced in head-like terminal spikes about .5 to 3 cm. long. *Corolla*: salver-form with four spreading or reflexed lobes, dry and white-translucent, and about 3 to 5 mm. wide. *Fruit*: a two-seeded capsule about 3 mm. long. *Occurrence*: scattered in grasslands at lower to intermediate elevations in the Tassajara region, and locally abundant in areas where the soil is poor or compacted, such as on the summit of knolls or in trail beds. *Distribution*: from Oregon to northern Baja California and the Channel Islands, mostly below 2,500 ft. ⊛March-May.

***Plantago lanceolata** Linnaeus. Rib Grass, English Plantain, Buckhorn, Ribwort (p. 132). *Habit*: perennial herbs with flowering stems ranging from about 2 to 8 dm. (8-32") tall. *Leaves*: strictly basal and produced in rosettes, the blades mostly oblong-lanceolate and gradually tapering to the petiole, about 5 to 20 cm. long, and with pronounced longitudinal ribs. *Inflorescence*: terminal head-like spikes about 2 to 8 cm. long. *Corolla*: dry, translucent, and with four spreading lobes about 2 to 2.5 mm. long. *Fruit*: an oblong-ovoid capsule about 2 to 3 mm. long. *Occurrence*: occasional at pull outs along Tassajara Rd., at campsites, and sometimes along trails. *Distribution*: a common weed in California, particularly in lawns, in and around gardens, and in agricultural lands; native to Europe. ⊛April-Aug.

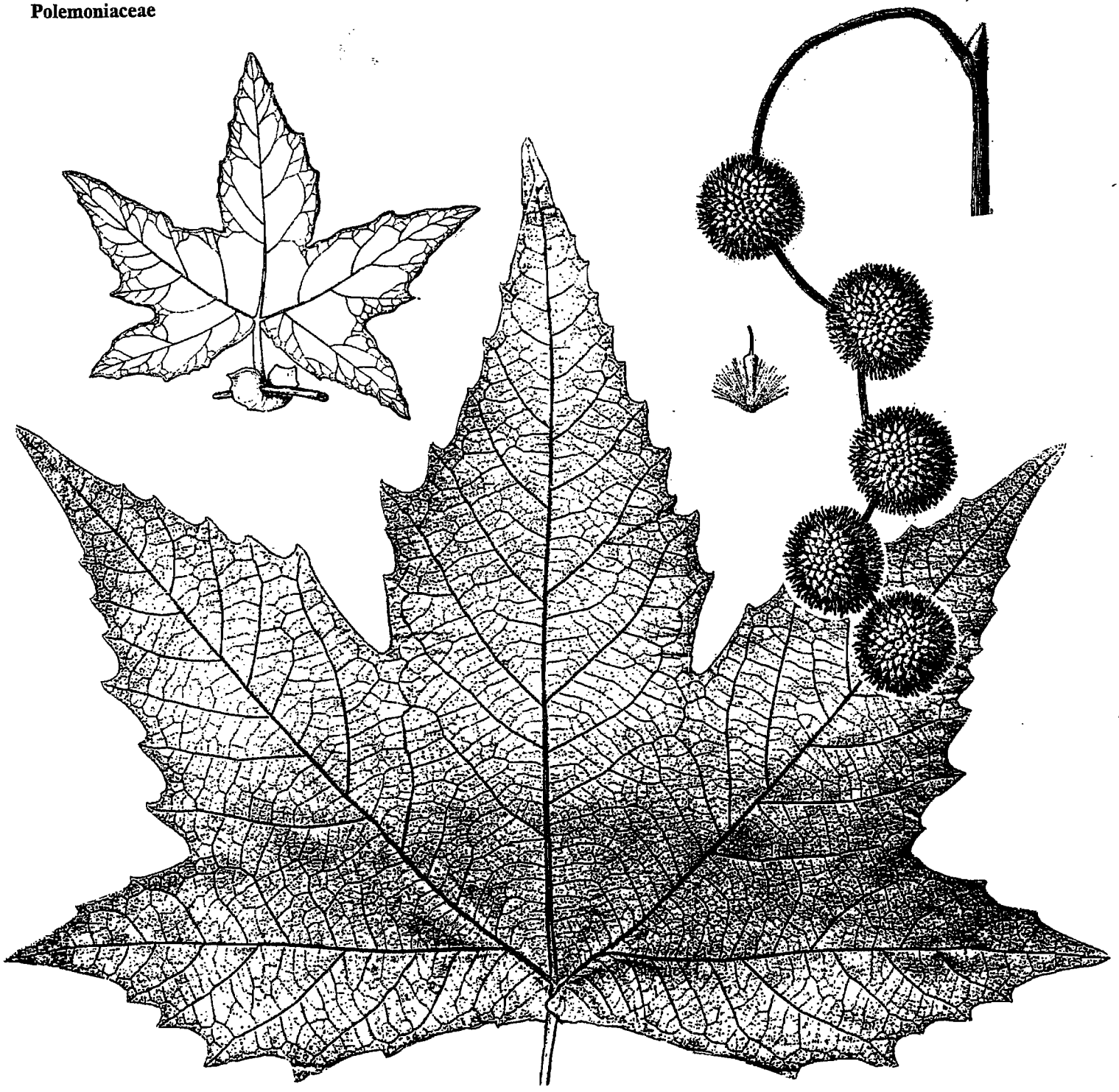
PLATANACEAE. Sycamore or Plane-Tree Family.

A family of trees consisting of only one genus.

PLATANUS. Sycamore Trees, Plane-Trees.

Eight to ten species of North America and Eurasia. Two species occur in Eurasia, one ranging from southeastern Europe to the southern slopes of the Himalayan Mts. in Nepal, the other in southeast Asia. Of the North American species, most are native to Mexico, with one ranging northward into Arizona, and another ranging southward into Guatemala. Of the remaining two species, one is widely distributed in the eastern United States, while the other is endemic to the California Floristic Province.

Platanus racemosa Nuttall. California Sycamore, Western Sycamore (p. 134). *Habit*: broadleaf deciduous trees of riparian habitats that vary from erect and up to 30 meters (98'+) tall in densely wooded areas where there is competition for light, to spreading and with an often tortuous manner of growth in open habitats. *Bark*: smooth and at first ash-white, but becoming gray-green with age, and eventually flaking away in thin scales, thus exposing a new layer of ash-white bark. The bark on the trunks and primary branches of very old trees is persistent, and becomes thick and fissured into grayish plates. *Leaves*: alternate, the petioles about 3 to 12 cm. long, the blades up to 4.5 dm. (18") wide, generally deltate in outline and palmately parted into five acute lobes. The margins are toothed at the end of the lateral veins. *Inflorescence*: pendulous racemes with three to five ball-like clusters about 1 to 3 cm. wide. The clusters are usually either staminate or pistillate. *Fruit*: bristled akenes about 5 mm. long. *Occurrence*: common and quite conspicuous along perennial or generally perennial streams at lower to intermediate elevations in the Tassajara region. Occasionally trees are found away from riparian habitats, but only in places where the watertable is near the surface. *Distribution*: scattered in riparian habitats from the upper Sacramento Valley and the northern Sierra Foothills to the southern Sierra Foothills in Kern Co., and in the Coast Ranges, from east and south of San Francisco Bay to southern California and northern Baja California. *Notes*: *Platanus racemosa* is commonly infected with a canker, *Gnomonia veneta* (sycamore anthracnose), which is present in the trees of the Tassajara region. The canker is active only during the rainy season, and causes budding leaves to wither and die. In drought years the local trees start to develop their leaves by late April or early May, but in years in which the rains linger into May, the trees may not develop their leaves until mid-June. During the spring months I have observed branchlets of trees extending under the eves of buildings at Tassajara Hot Springs with fully developed leaves, while the rest of plant was still barren. In the developed of Tassajara Hot Springs there are a number of trees representing *P.* X *acerifolia*, the London Plane-Tree of ornamental horticulture. According to McDonald (n/d), the trees were planted in the 1930's. ⊛Feb.-April.



Platanus racemosa

POLEMONIACEAE. PHLOX FAMILY.

About 19 genera and 320 species of herbs, shrubs and vines of the Americas and northern Eurasia, with most of the species occurring in western North America. The family is very well represented in California, for 169 species (plus numerous lesser taxa) are present within the boundaries of the state, and about 75 (plus about 37 lesser taxa) are endemic to the California Floristic Province.

1a. Densely tufted evergreen subshrubs. . . . . ***Eriastrum.***
1b. Annual herbs:
2a. Leaves opposite or at least some leaves opposite:
3a. Leaves divided from the base into narrowly linear segments, and thus may appear as whorls of narrow leaves. . . . . ***Linanthus.***
3b. Leaves entire. . . . . ***Phlox.***
2b. Leaves alternate (leaves of some species primarily in basal rosettes):

4a. Calyces without membranous tissue between ribs, the sinuses pleated and expanding with the maturing capsule. . . . . ***Collomia.***
4b. Calyces with membranous tissue between ribs, the sinuses not expanding with the capsule, and thus eventually rupture:
5a. Inflorescence densely bracted, the bracts spiny-toothed. Calyx lobes not equal in size. . . . . ***Navarretia.***
5b. Inflorescence not bracted. Calyx lobes nearly equal in size:
6a. Leaves finely dissected into narrowly linear segments or lobes. . . . . ***Gilia.***
6b. Lower and middle leaves pinnately lobed or entire, upper leaves mostly palmately divided into 3 leaflets or lobes, the terminal segment much larger than the lateral segments. . . . . ***Allophyllum.***

ALLOPHYLLUM. FALSE GILIA, STRAGGLING GILIA.

Four species plus one lesser taxa of southwestern-temperate North America. All of the taxa occur in California, and four are endemic to the California Floristic Province.

1a. Widest leaves or leaflets more than 3 mm. wide. Corolla with dark reddish-purple tubes and pink lobes. . . . . ***A. divaricatum.***
1b. Widest leaves or leaflets less than 3 mm. wide. Corollas blue, purplish-blue or sometimes pale. . . . . ***A. gilioides.***

Allophyllum divaricatum (Nuttall) A. & V. Grant (p. 136). *HABIT*: annual herbs with simple or branched stems ranging from about 1 to 6 dm. (4-24") tall. *LEAVES*: alternate, about 1-8 cm. long (inclusive of the petiole), the lower-most sometimes clustered and generally oblanceolate in outline and regularly or irregularly pinnately lobed, the middle usually simple and narrowly oblong to broadly linear, and the upper-most reduced, generally sessile, mostly oblong-lanceolate or oblanceolate, and commonly with a pair of small lobes or leaflets at the base. *INFLORESCENCE*: flowers are produced in relatively loose terminal clusters. *COROLLA*: narrowly funnelform, about 8 to 22 mm. long, and with reddish-purple tubes and five pink or pinkish-violet lobes. *FRUIT*: a roundish and three-celled capsule about 2 to 4 mm. long. *OCCURRENCE*: widely scattered and moderately common in open and grassy areas in the Tassajara region. *DISTRIBUTION*: Coast Ranges, from Humboldt and Trinity Counties to the Santa Lucia Mts. of northwestern San Luis Obispo Co., and on the western slope of the Sierra Nevada, from Shasta Co. to Kern Co., and again in the Transverse Ranges, in the vicinity of Mt. Pinos, (Ventura Co.), the San Gabriel Mts., and occasionally in the San Bernardino Mts. ⊛April-July.

Allophyllum gilioides (Bentham) A. & V. Grant subsp. **violaceum** (Heller) A. Day [*A. v.* (Heller) A. & V. Grant, *Collomia g.* Bentham, *Gilia g.* Greene] (p. 136). *HABIT*: annual herbs with simple or branched stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: alternate and about .5 to 6 cm. long (inclusive of the petiole), the lower-most, which are generally clustered and tending to be shed rather early, are mostly oblong-oblanceolate in outline and pinnately lobed, the middle are usually simple and linear to narrowly oblanceolate, while the upper leaves are generally sessile and commonly three-parted or lobed, with the central segment by far the largest. *INFLORESCENCE*: the flowers are small and produced singularly or in open cymes of two to three. *COROLLA*: narrowly funnelform, about 6 to 10 mm. long, five-lobed, and deep purplish-blue or sometimes quite pale. *FRUIT*: a roundish and three-seeded capsule about 2 to 4 mm. long. *OCCURRENCE*: widely scattered and locally common in grassy openings in woodlands and chaparral in the Tassajara region, but fairly inconspicuous and easily overlooked. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from northern California to San Diego Co. *NOTE*: although the typical form of this species is to be expected in this region, all of the closely observed material more closely corresponded to subsp. *violaceum*. Distinguishing characteristics between the taxa include the habit of the inflorescence (the flowers 4 to 8 in relatively close cymose clusters in subsp. *gilioides*, and solitary or in open cymes of 2's or 3's in subsp. *violaceum*) and leaves (pinnate leaves many in subsp. *gilioides* and few in subsp. *violaceum*). ⊛April-July.

COLLOMIA. GLUE-SEED.

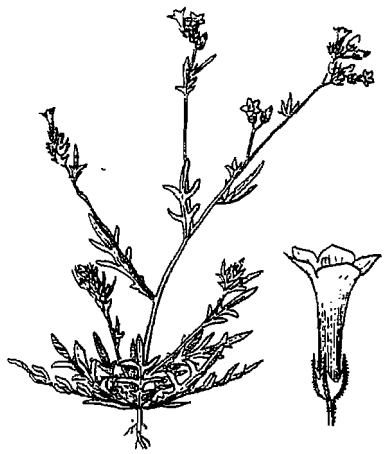
Fifteen species primarily of North America, but also of temperate South America.

1a. Plants mostly not branched, but if so, the branches are erect and parallel to the main stem. Leaves sessile, mostly lanceolate or linear-lanceolate, and entire. Corollas 15 to 30 mm. long. . . . . ***C. grandiflora.***
1b. Plants usually diffusely branched. Leaves mostly petiolate (except the uppermost), mostly oblanceolate or obovate in outline, and variously lobed or parted (or sometimes almost entire). Corollas 10 to 14 mm. long. . . . . ***C. heterophylla.***

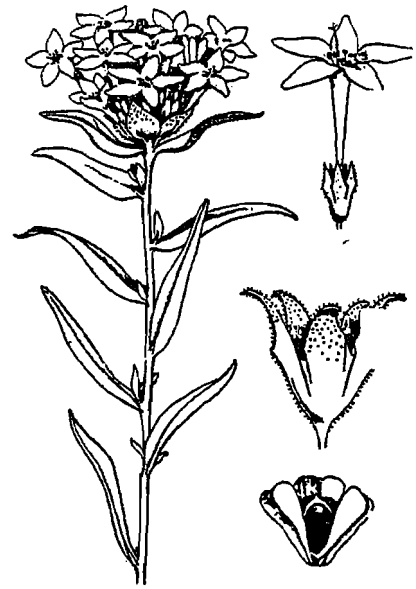
Collomia grandiflora Douglas ex Lindley (p. 136). LARGE FLOWERED COLLOMIA. *HABIT*: annual herbs usually with a single erect stem ranging from about 1 to 6 dm. (4-24") tall. *LEAVES*: alternate, sessile, linear-lanceolate to linear with entire margins, and about 3 to 5 cm. long. *INFLORESCENCE*: the flowers are produced in terminal clusters. *COROLLA*: narrowly funnelform, about 1.5 to 3 cm. long, five-lobed, and white with a peach or salmon tinge. *FRUIT*: an obovoid capsule about 5 mm. long. *OCCURRENCE*: widely scattered in open grassy areas in the Tassajara region, but uncommon, although abundant in a meadow along the fire-break trail between the Pine Ridge Trail and the junction of Tassajara and the road to the Church Homestead. At all other known localities it is lightly scattered, such as along the Pine Ridge Trail between the first summit west of China Camp and the Church Creek Divide, in a meadow about half way up the Horse Pasture-Tassajara Cutoff Trail, in open areas on Chew's Ridge, and along the floodplains of Tassajara Creek between The Narrows and the Arroyo Seco River. *DISTRIBUTION*: scattered in mountainous areas of western North America, from British Columbia to Colorado, Arizona and southern California. ⊛April-July.

⇩/**Collomia heterophylla** Douglas ex Hooker. VARIABLE-LEAFED COLLOMIA (p. 136). *HABIT*: small and usually diffusely-branched annual herbs ranging from about .5 to 2.5 dm. (2-10") tall. The plants are glandular and often emit a somewhat skunk-like odor. *LEAVES*: alternate, about .5 to 4 cm. long, and highly variable in shape, with the blades of the larger lower leaves being mostly oblanceolate in outline and pinnately parted into irregularly toothed leaflets or lobes, while the blades of the upper leaves are mostly obovate and irregularly lobed or toothed towards the apex or entire. *INFLORESCENCE*: the flowers are small and produced in terminal and sometimes axillary clusters. *COROLLA*: narrowly funnelform, five-lobed, pinkish-lavender to nearly white, and 1 to 1.4 cm. long. *FRUIT*: an oblong capsule about 4 to 6 mm. long. *OCCURRENCE*: widely scattered and locally common above about 3,000 ft. in the Tassajara region, such as on Black Butte, along the Pine Ridge Trail, the upper regions of Church Creek, etc., and occurring mostly semi-shady areas in woodlands and chaparral. *DISTRIBUTION*: from British Columbia and Idaho southward, to Kern Co. in the Sierra Nevada, and to the Santa Lucia Mts. of Monterey and northwestern San Luis Obispo Co. in the Coast Ranges. ⊛April-June.

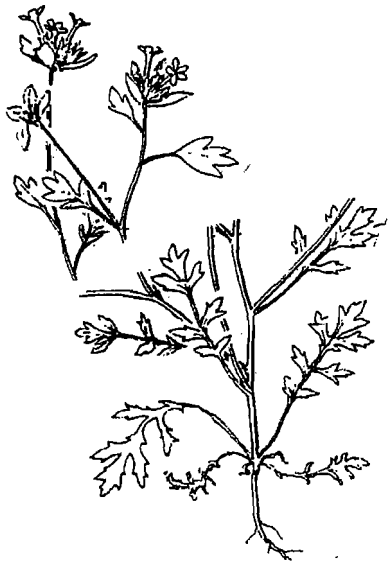
Allophyllum divaricatum



Allophyllum gilioides

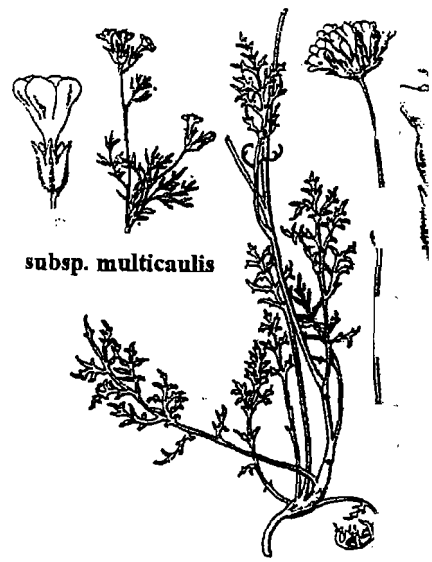


Collomia grandiflora



Collomia heterophylla

Eriastrum densifolium



subsp. multicaulis

Gilia achilleaefolia

Gilia clivorum

Gilia splendens

Linanthus ciliatus

ERIASTRUM. WOOL-FLOWER.

Thirteen species of western North America. All of the species occur in California, and six are endemic to the California Floristic Province.

⇧**Eriastrum densifolium** (Bentham) Mason subsp. **elongatum** (Bentham) Mason [*Hugelia elongata* Bentham]. LEAFY WOOL-FLOWER (p. 136). *HABIT*: densely tufted evergreen subshrubs with woody and generally decumbent primary branches and numerous slender and erect or ascending secondary branches ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: alternate, crowded, white-woolly, about .5 to 4 cm. long, and variously cleft into narrow and sharply acute lobes, the lower leaves irregularly so, while the upper leaves typically have one to several pairs of remote and opposing lobes. *INFLORESCENCE*: the showy flowers are produced in head-like terminal clusters in which the calyces are conspicuously embedded in white-woolly hair. *COROLLA*: salverform, five-lobed, bright blue, and about 14 to 18 mm. long. *FRUIT*: an ellipsoid capsule about 3 to 4 mm. long. *OCCURRENCE*: occasional in openings in chaparral, such along Tassajara Road between the Black Butte summit and the crossing of Wildcat Creek (i.e., The Cascades or Bathtub Spring), and along the Pine Ridge Trail a short distance beyond the first summit west of China Camp. According to a note enclosed in an envelope attached to the sheet of A. D. E. Elmer's "Tassajara Hot Springs" specimen of June, 1901, it was collected "near Pine Valley" (Elmer 3259 DS). *DISTRIBUTION*: scattered in the Coast Ranges, southern Sierra Nevada, Transverse and Peninsular Ranges, from Monterey and Inyo Counties to northern Baja California. ⊛May-Sept.

GILIA.

About 70 species of temperate western North America and temperate South America. Forty-seven species plus 31 lesser taxa occur in California.

1a. Corollas more than 9 mm. long:
2a. Flowers borne in fan-shaped to roundish head-like clusters. Corollas white with blue-violet lobes. . . ***G. achilleaefolia achilleaefolia***.
2b. Flowers borne in few-flowered cymes. Corollas rose to purplish-pink. . . . . ***G. splendens***.
1b. Corollas less than 9 mm. long:
3a. Corolla tubes with 5 pairs of dark-purple spots on the throat. Pollen pale-blue. . . . . ***G. clivorum***.
3b. Corolla tubes without spots. Pollen creamy-white. . . . . ***G. achilleaefolia multicaulis***.

Gilia achilleaefolia Bentham [*G. capitata* Douglas var. *a.* (Bentham) Mason]. CALIFORNIA GILIA (p. 136). *HABIT*: erect annual herbs ranging from about 2 to 7 dm. (6-28") tall. *LEAVES*: alternate and about 1 to 10 cm. long, primarily basal in some plants and well developed upward in other plants, the lower-most often in rosettes, the blades ovate to oblong-oblanceolate in outline and bipinnately dissected, the lower petiolate and the upper sessile and reduced in size and in complexity. *INFLORESCENCE*: the flowers are few to many in fan-shaped to roundish terminal clusters. *COROLLA*: broadly funnelform, about 10 to 20 mm. long, mostly white, but the enlarged throats are often yellowish tinged, and the five lobes are pale to medium blue-violet. *FRUIT*: an ovoid and 10 to 18 seeded capsule about 3 to 6 mm. long. *OCCURRENCE*: although this taxon is widely scattered and locally common in open grasslands at all elevations in the Tassajara region, populations vary considerably from year to year. In places where it occurs plants can form dense stands covering several acres in some years, but can be rare or absent in other years. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Marin and Contra Costa Counties to Santa Barbara Co. ⊛April-June.

Gilia achilleaefolia subsp. **multicaulis** (Bentham) A. & V. Grant [*G. multicaulis* Bentham, *G. m.* var. *peduncularis* (Eastwood) Jepson] (p. 136). *HABIT*: highly variable annual herbs ranging from about 1.5 to 6 dm. (6-24") tall, with plants growing in densely grassy areas tending to be simple or upwardly few-branched and often with primarily basal foliage, while plants growing in more open habitats tend to be diffusely branched and leafy throughout. *LEAVES*: alternate and about 1 to 6 cm. long, the lower petiolate, broadly ovate to oblong in outline, and pinnately or bipinnately divided into narrow and usually toothed lobes or segments, while the upper are sessile and pinnately or irregularly divided into linear and entire segments, the axis of which are often falcate. *INFLORESCENCE*: the flowers are small and usually produced in two's or three's (or sometimes singularly or in groups of up to 7) in loose terminal clusters, on slender and elongating pedicels up to 6 cm. long in fruit. *COROLLA*: funnelform, about 5 to 7 mm. long, the throat pale and often yellowish-tinged, the five lobes blue or purplish-blue. *FRUIT*: a shortly oblong and many-seeded capsule about 3 to 6 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, and occurring primarily in grasslands or in grassy openings in woodlands. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Marin and Contra Costa Counties to Santa Barbara Co. *NOTES*: although this taxon is fully compatible with the typical species (Grant '54a), the morphological characteristics are so radically distinct that the retention of a subspecific classification is still quite useful. Large-flowered plants representing the typical species tend to be bee-pollinated, while the small flowered *multicaulis*-like plants are mostly self-pollinating. ⊛April-June.

Gilia clivorum (Jepson) Grant [*G. multicaulis* Bentham var. *clivorum* Jepson]. HILLSIDE GILIA (p. 136). *HABIT*: delicate annual herbs with slender stems ranging from about 1.5 to 4 dm. (6-16") tall. Plants growing in densely grassy habitats tend to have an erect and simple (or few-branched) primary stem, while plants growing in more open areas tend to have many diffuse branches. *LEAVES*: alternate and 1.5 to 9 cm. long, tending to be primarily basal in simple plants and well developed upwards in diffuse plants, and oblong to oblanceolate (or sometimes ovate) in outline and pinnately or bipinnately parted into narrow, simple or variously lobed segments. *INFLORESCENCE*: the flowers are produced mostly in few-flowered terminal glomerules, with pedicels up to 3 cm. long in fruit. *COROLLA*: funnelform, about 6 to 8 mm. long, and basically white, but the throats are yellowish-tinged and with five pairs of dark purplish-black spots, while the five lobes are blue or blue-violet towards the apex. *FRUIT*: an ovoid and many-seeded capsule about 5 mm. long. *OCCURRENCE*: widely scattered and locally common (but inconspicuous) in open and grassy habitats in the Tassajara region. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Lake Co. to western Ventura Co. and the northern Channel Islands. Also in Riverside Co. and Arizona. ⊛March-May.

⇧**Gilia splendens** Douglas [*G. tenuiflora* Bentham in part, *G. grinnellii* Brand]. SPLENDID GILIA (p. 136). *HABIT*: showy-flowered annual herbs typically with upwardly branched stems ranging from about 1.5 to 12 dm. (6-48") tall. *LEAVES*: primarily basal with the lower-most often in rosettes, about 1-9 cm. long, the blades mostly oblong-oblanceolate in outline and bipinnately divided into irregularly toothed segments or lobes. *INFLORESCENCE*: terminal cymes with the flowers usually produced in two's on pedicels of unequal length. *COROLLA*: funnelform, about 1.5 to 2 cm. long, and with purplish throats and five rose or slightly purplish-pink lobes. *FRUIT*: an oblong capsule about

4 to 6 mm. long. *OCCURRENCE*: widespread and locally common in the Tassajara region, primarily in grassy openings in woodlands and chaparral. *DISTRIBUTION*: Coast, Transverse and northeastern Transverse Ranges, from the Santa Lucia Mts. of Monterey Co. to the San Jacinto Mts. of Riverside Co. ⊛April-July.

LINANTHUS.

About 41 species of western North America and temperate western South America (Chile). The genus is primarily Californian, for 34 species plus six lesser taxa occur within the state, and 25 are endemic to the California Floristic Province.

1a. Flowers pediceled and not produced in head-like clusters. Corolla tubes about 1 mm. wide and included or mostly included within the calyx:
2a. Pedicels less than 5 mm. long. Corollas about 1.5 to 3 cm. long and open only from dusk to dawn. . . . . ***L. dichotomus***.
2b. Pedicels usually much more than 5 mm. long. Corollas mostly less than 1.5 cm. long and open during the daytime. . . . . ***L. liniflorus***.
1b. Flowers sessile in densely bracted terminal clusters. Corolla tubes much less than 1 mm. wide and much exserted from the calyx:
3a. Corolla tubes less than two and a half times longer than the calyx, the limbs mostly less than 6 mm. wide and rose-lavender. Floral bracts conspicuously ciliate. . . . . ***L. ciliatus***.
3b. Corolla tubes two to four times longer than the calyx, the limbs about 6 to 12 mm. wide, white or (rarely) yellow, and often tinged rose, lavender, or yellow. Floral bracts inconspicuously ciliate. . . . . ***L parviflorus***.

Linanthus ciliatus (Bentham) Greene. WHISKER-BRUSH (p. 136). *HABIT*: erect annual herbs with simple or branched stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: opposite, sessile, and divided at the base into five to eleven narrowly linear segments about 5 to 20 mm. long. *INFLORESCENCE*: the flowers are produced in densely bracted head-like terminal clusters which resemble soap brushes. *COROLLA*: narrowly salver-form and rose-lavender, the tube less than 1 mm. wide and about 10 to 25 mm. long, the limbs five-lobed and about 3 to 6 mm. wide. *FRUIT*: an oblong capsule about 6 mm. long. *OCCURRENCE*: lightly scattered in open and grassy habitats in the Tassajara region, and occurring mostly in small colonies. *DISTRIBUTION*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from southern Oregon to San Diego Co. ⊛April-June.

Linanthus dichotomus Bentham. EVENING SNOW (p. 140). *HABIT*: annual herbs with slender and erect stems which are usually simple from the base but dichotomously branched above, and ranging form about .5 to 2.5 dm. (2-10") tall. *LEAVES*: opposite, remote, sessile, and divided at the base into filiform segments about 1 to 3 cm. long. *INFLORESCENCE*: the showy flowers are terminal and axillary in open cymes. *COROLLA*: broadly funnelform, about 2 to 3 cm. long, five lobed, and white with brownish and fairly broad lines on the outside. The corollas open towards dusk and close with the rising of the sun. *FRUIT*: an oblong and several-seeded capsule about 3 to 4 mm. long. *OCCURRENCE*: locally common in open areas in the vicinity of Tassajara Hot Springs, such as on the Hog's Back and the flood-plains of Tassajara Creek, but not known to occur elsewhere in this region. *DISTRIBUTION*: from Napa and Sonoma Counties in the Coast Ranges, and from Butte Co. in the Sierra Nevada Foothills, to San Diego Co., and eastward, across the deserts, to Nevada and Arizona. ⊛April-June.

Linanthus liniflorus (Bentham) Greene [*L. l.* var. *pharnaceoides* (Bentham) Hoover, *L. l.* subsp. *p.* (Bentham) Mason, *L. p.* (Bentham) Greene]. FLAX-FLOWERED LINANTHUS (p. 140). *HABIT*: annual herbs with slender and upwardly branched stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: opposite, remote, sessile and divided at the base into three to nine narrowly linear segments about .5 to 3 cm. long. *INFLORESCENCE*: cymose-paniculate with the flowers terminal and axillary on filiform pedicels about 1 to 2.5 cm. long. *COROLLA*: broadly funnelform, mostly less than 1 cm. long, five-lobed, white or with a lilac tinge, and with purplish veins radiating from the center of the tube. *FRUIT*: an oval and several-seeded capsule about 2 mm. long. *OCCURRENCE*: widely scattered and locally common in open areas in the Tassajara region, particularly in very exposed places where the soil is poor or sandy. *DISTRIBUTION*: western North America, from Washington and Idaho to southern California. ⊛April-September.

Linanthus parviflorus (Bentham) Greene [*L. androsaceus* (Bentham) Greene subsp. *luteolus* (Greene) Mason, *L. l.* Greene, *L. p.* var. *l.* (Greene) Milliken, *L. plaskettii* Eastwood, *L. a.* subsp. *p.* (Eastwood) Mason, *Gilia tassajarae* Brand, *L. a.* subsp. *luteus* (Bentham) Mason, *L. a.* subsp. *croceus* (Milliken) Mason]. SHOWER GILIA (p. 140). *HABIT*: relatively small but showy-flowered annual herbs ranging from about .5 to 3 dm. (2-12") tall. *LEAVES*: opposite, remote, sessile, and divided at the base into five to nine narrowly linear lobes about 4 to 12 mm. long. *INFLORESCENCE*: the flowers are sessile in densely bracted and head-like terminal clusters. *COROLLA*: narrowly salverform with broadly flaring limbs, the tubes yellow or yellowish and 1 to 3.5 cm. long (but less than 1 mm. wide), the five-lobed limbs white and frequently tinged rose or lavender (or sometimes entirely yellow), and about 6 to 12 mm. wide. *FRUIT*: an ellipsoid capsule about 4 to 5 mm. long. *OCCURRENCE*: widespread and locally common to abundant in the Tassajara region, and occurring mostly in grasslands and grassy openings in woodlands. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Lake and Mendocino Counties to northern Baja California, and in the Sierra Nevada foothills, from Butte Co. to Fresno Co. *NOTE*: this is a highly variable entity which Mason (in Abrams, vol. 3, '51) and Munz ('59) recognized as numerous subspecies of *L. androsaceus*. The treatment here follows Patterson (in Hickman, ed., '93). The vast majority of the local plants more or less fit the description of what was recognized by Mason as *L. a.* subsp. *plaskettii* (the type of which was from Santa Lucia Mts.), which he apparently later included within *L. a.* subsp. *luteolus* (Munz, '59). Synonymous to both of these interpretations was *Gilia tassajarae* Brand (misspelled "*jassajarae*" by Brand), the type specimen of which was collected at Tassajara Hot Springs by A. D. E. Elmer (Elmer #3255) in June of 1901 (Jepson, '43). Lightly scattered in open grasslands along the Pine Ridge Trail between China Camp and the Church Creek Divide are depauperate plants with small and light yellow corollas. I suspect such plants represent what Howitt & Howell ('64) determined to be *L. a.* subsp. *croceus* (from the "Pine Valley Trail"), and what Griffin ('75) recognized as *L. a.* subsp. *luteus*. ⊛April-June.

NAVARRETIA.

About 30 species of temperate western North America and temperate South America (Chile and Argentina). The genus is primarily Californian, for 27 species occur in California, and 20 are endemic to the California Floristic Province.

1a. Plants not glandular. Corollas white. . . . . ***N. intertexta***.
1b. Plants glandular. Corollas light blue to dark purplish blue:

2a. Plants sparsely glandular-pubescent, the glandular hairs restricted mostly to the stems and inflorescence. Axis of upper leaves oblong-elliptic to oblong-linear. . . . . *N. atractyloides.*

2b. Plants densely glandular-pubescent throughout. Axis of upper leaves narrowly linear to narrowly lance-linear. . . . . *N. mellita.*

Navarretia atractyloides (Bentham) Hooker & Arnott. HOLLY-LEAFED NAVARRETIA (p. 140). *HABIT*: small thistle-like annual herbs with erect, simple or branched stems ranging from about .5 to 3 dm. (2-12") tall. *LEAVES*: alternate and about 1 to 4 cm. long, the lower with a narrowly linear axis and with short, sharply acute and irregularly pinnate lobes, the upper with an oblong-elliptic to oblong-linear axis and with spiny toothed margins. *INFLORESCENCE*: the flowers are produced in dense and spiny-bracted terminal and lateral clusters. *COROLLA*: narrowly funnelform, five-lobed, dark-purplish-blue, and about 8 to 10 mm. long. *FRUIT*: an ovoid capsule about 3 to 4 mm. long. *OCCURRENCE*: lightly scattered in small colonies in grassy opening in woodlands and chaparral along the Horse Pasture and Church Creek Trails (the Church Creek Fault Zone), but not known to occur elsewhere in the Tassajara region. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊛May-July.

Navarretia intertexta (Bentham) Hooker (p. 140). *HABIT*: annual herbs with simple or branched stems ranging from about .2 to 2 dm. (1-8") tall. *LEAVES*: alternate and about 1 to 5 cm. long, the blades pinnately or bipinnately divided into narrowly linear and needle-like lobes. *INFLORESCENCE*: head-like terminal clusters which are subtended by pinnately lobed bracts which strongly resemble the leaves. *COROLLA*: narrowly funnelform, generally white, five-lobed, and about 5 to 9 mm. long. *FRUIT*: a one or two celled capsule less than 3 mm. long. *OCCURRENCE*: known to occur in this region only at vernal seeps on massive sandstone outcrops in Pine Valley, a short distance north-northeast of Pine Valley Camp. *DISTRIBUTION*: western North America, from British Columbia to Colorado, Arizona and northern Baja California. ⊛May-July.

Navarretia mellita Greene. HONEY-SCENTED NAVARRETIA (p. 140). *HABIT*: small and densely glandular-pubescent annual herbs with simple or branched stems ranging from about .5 to 2 dm. (2-8") tall. *LEAVES*: alternate and about .5 to 3 cm. long, the axis narrowly linear and pinnately or irregularly divided into sharply acute lobes. *INFLORESCENCE*: dense and spiny-bracted head-like terminal clusters. *COROLLA*: funnelform and about 5 to 7 mm. long, the throat white and the five lobes light blue. *FRUIT*: an ovoid capsule about 3 to 4 mm. long. *OCCURRENCE*: scattered in open areas on Chew's Ridge, but not known to occur elsewhere in this region. *DISTRIBUTION*: Coast Ranges, from Humboldt Co. to San Luis Obispo Co. Also in the Sierra Nevada Foothills of Tuolumne Co. ⊛May-July.

PHLOX.

About 60 species of northern Asia and the Americas.

Phlox gracilis (Hooker) Greene [*Microsteris g.* (Hooker) Greene, *Gilia g.* Hooker, *M. g.* subsp. *humilis* (Greene) Grant]. ANNUAL PHLOX, BEGGAR GILIA (p. 140). *HABIT*: highly variable annual herbs with simple and erect or decumbent and branching stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: mostly opposite but usually with some alternate, about 1 to 4 cm. long and with entire margins, the lower short-petiolate and generally oblong-oblanceolate, the upper sessile and narrowly oblong to oblong-lanceolate. *INFLORESCENCE*: the flowers are small and produced singularly or in terminal cymes. *COROLLA*: salverform and about 8 to 12 mm. long, the tube yellowish and the five-lobed limbs pale to dark rose. *FRUIT*: an ovoid capsule about 4 to 7 mm. long. *OCCURRENCE*: lightly scattered in open and usually grassy habitats in the Tassajara region, and tending to occur singularly or in small groups. *DISTRIBUTION*: widely distributed in western North America, from British Columbia and Montana to northern Mexico. Also in South America. ⊛March-June.

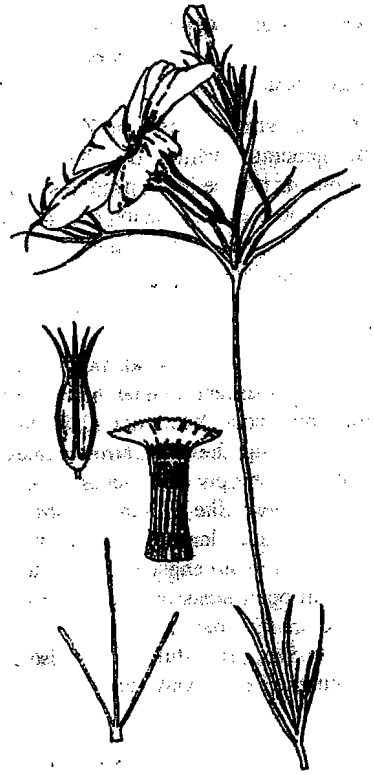
POLYGALACEAE. MILKWORT FAMILY.

Polygalaceae is comprised of about 15 to 18 genera and about 800 species of primarily tropical and subtropical herbs, vines, shrubs and small trees.

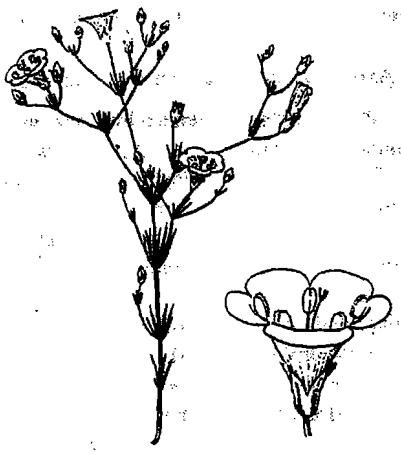
POLYGALA. MILKWORT

Approximately 500 species of tropical, subtropical and temperate regions. *Polygala* means much milk, and refers to a belief that cattle which feed upon some European species produce more milk.

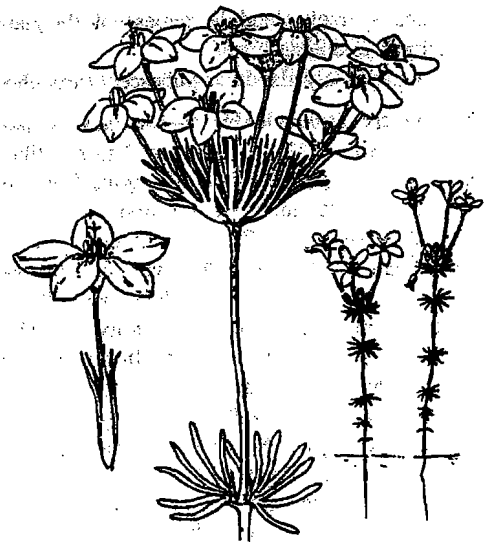
Polygala californica Nuttall. CALIFORNIA MILKWORT (p. 140). *HABIT*: small and more or less woody-based perennial herbs with several decumbent to ascending stems ranging from about 3 to 35 cm. (1.25-14") long. *LEAVES*: alternate, mostly lance-oblong to elliptic with entire margins, and about 1 to 3 cm. long. *INFLORESCENCE*: the flowers are produced in both terminal and basal racemes. *COROLLA*: absent in the three-sepaled flowers of the basal racemes, and three in the five-sepaled flowers of the terminal racemes (the inner two sepals are greatly enlarged, petal-like, and bright to pale rose). The upper two petals are small, narrow, and deep rose-pink towards the apex, while the much larger lower petal is creamy-white, sack-like, and engulfs the stamens, pistil and ovary. *FRUIT*: a disk-like and outwardly two-lobed capsule about 7 mm. long. *OCCURRENCE*: known to occur in this region only in a small area of chaparral within a mixed evergreen forest along the Pine Ridge Trail above Bear Basin and a few hundred feet from the Tassajara Canyon overlook (twenty-one plants were counted at this site in June of 1992). As this species occurs primarily in chaparral and woodlands, it is probably more widely scattered in this region (Griffin, '75, reported the species to be uncommon on Pine Ridge between 600 and 1400 m.). *DISTRIBUTION*: outer Coast Ranges, from southern Oregon to the Santa Lucia Mts. of northwestern San Luis Obispo Co., with a remote population on Santa Cruz Island (Santa Barbara Co.) ⊛ March-July.



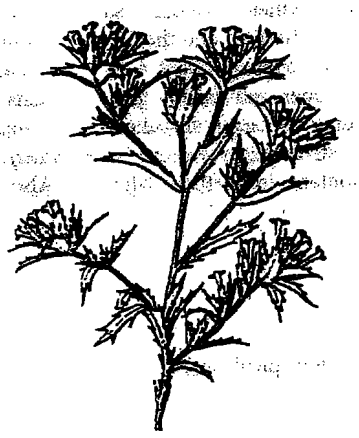
Linanthus dichotomus



Linanthus liniflorus

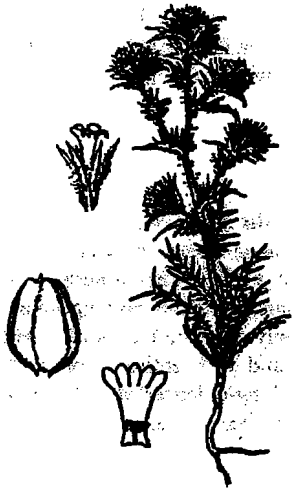


Linanthus parviflorus

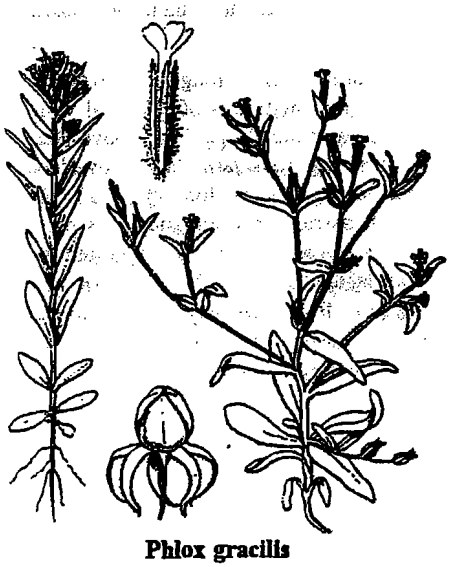


Navarretia atractyloides

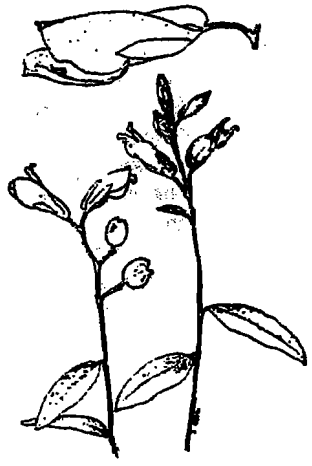
Navarretia intertexta



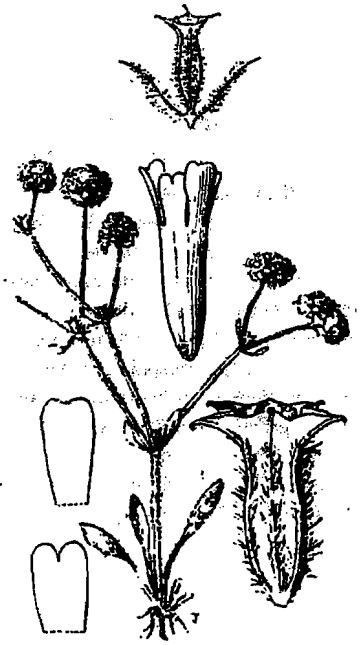
Navarretia mellita



Phlox gracilis



Polygala californica



Chorizanthe douglasii

POLYGONACEAE. BUCKWHEAT FAMILY.

Polygonaceae is a diverse family of chiefly northern temperate herbs and shrubs, comprised of 49 or 50 genera and about 1100 to 1150 species worldwide (Reveal '89b, Thorne '92). The family includes a few edible plants, such as the akenes of *Fagopyrum* (buckwheat), the petioles of *Rheum rhaponticum* (rhubarb), and the leaves of *Oxyria digyna* (winter or mountain sorrel), as well as a few ornamentals, such as *Antigonon* (mountain rose-vine), *Muehlenbeckia* (tapeworm plant), and some species of *Eriogonum* (wild buckwheat). *Polygonaceae* is represented in the Tassajara Canyon by perhaps as many as 16 currently accepted taxa in five genera, with most of the native taxa belonging to the chiefly western North American subfamily *Eriogonoideae*. *Eriogonoideae* is particularly well represented in the California Floristic Province, were a large number of the taxa are endemic, including a number of more or less rare and restricted monotypic genera, such as *Systenotheca*, *Mucronea*, *Centrostegia*, *Hollisteria*, *Lastarriaea*, *Aristocapsa*, and *Dodecahema*, as well as the much more common and widely distributed (but primarily Californian) *Pterostegia*.

1a. Leaves subtended by sheath-like stipules:
2a. Calyces four or five-parted. . . . . ***Polygonum.***
2b. Calyces six-parted. . . . . ***Rumex.***
1b. Leaves not subtended by stipules:
3a. Delicate vine-like annual herbs with weak and trailing stems. Leaves opposite, remote, roundish to obovate and frequently obcordate. Flowers inconspicuous; the involucres two-winged in maturity and loosely enclosing the akene. . . . . ***Pterostegia.***
3b. Erect or ascending herbs, subshrubs or shrubs. Leaves opposite or alternate, narrowly linear to roundish, but never obcordate. Flowers readily evident; involucres cylindric to campanulate or funnelform:
4a. Involucres many flowered, the ribs not spine-tipped. Annual and perennial herbs, subshrubs and shrubs. . . . . ***Eriogonum.***
4b. Involucres one or two flowered, the ribs terminating in more or less stiff and often hooked spine-like teeth. Annual herbs. . . . . ***Chorizanthe.***

CHORIZANTHE. SPINE-FLOWER.

About fifty species of temperate western North America and temperate western South America. The genus is primarily Californian, for 33 species occur within the state of California, and 27 are endemic to the California Floristic Province.

1a. Leaves narrowly linear to very narrowly oblanceolate, mostly alternate, and produced along most of the length of the stems. Membranes between involucre spines white-translucent. . . . . ***C. membranacea.***
1b. Leaves oblong-ovate to oblanceolate or narrowly-oblanceolate, and produced in basal rosettes or in whorls at the nodes. Membranes between involucre spines (if present) rose to purplish-pink:
2a. Involucre with membranous margins between the spines. Leaves oblanceolate to narrowly oblanceolate, and produced in basal rosettes and opposite or whorled at the lower nodes. . . . . ***C. douglasii.***
2b. Involucre without membranous margins between the spines. Leaves oblong to oblong-ovate and produced only in basal rosettes. . . . . ***C. staticoides.***

Chorizanthe douglasii Benthem [*C. norionii* Greene]. SANTA LUCIA SPINE-FLOWER (p. 140). *HABIT*: gray-green annual herbs usually with simple, erect and upwardly branched stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: produced in basal rosettes and opposite or whorled at the lower nodes, the petioles about .5 to 2.5 cm. long, the blades oblanceolate to linear-oblanceolate and about .5 to 4 cm. long. *INFLORESCENCE*: the flowers are produced in head-like terminal, and sometimes singularly in the upper axils. *COROLLA*: absent, although the corolla-like involucres, which are about 3 to 5 mm. long, have rose-violet to reddish-purple membranes between the six spreading spines, while the six-parted calyces are mostly rose-pink and about 3.5 to 4.5 mm. long. *FRUIT*: a narrow and three-angled akene about 3.5 mm. long. *OCCURRENCE*: this is the most common *Chorizanthe* in the Tassajara region, for it is widespread and locally common in open and usually grassy areas at all elevations. *DISTRIBUTION*: mostly in the Santa Lucia Mts. of Monterey and San Luis Obispo Counties, but also in the Gavilan Range (in both Monterey and San Benito Counties), and the La Panza Range of San Luis Obispo Co. ⊛April-July.

Chorizanthe membranacea Benthem. PINK SPINE-FLOWER (p. 145). *HABIT*: annual herbs with erect and simple or few-branched stems ranging from about 1 to 4.5 dm. (4-18") tall. *LEAVES*: mostly alternate and well distributed on the stems, narrowly linear to very narrowly oblanceolate, and about 1 to 6 cm. long. *INFLORESCENCE*: the flowers are produced in terminal and lateral clusters or sometimes singularly in the axils of the leaves. *COROLLA*: absent, although the involucres, which are about 4 to 7 mm. wide, have six deep-red and widely spreading spines that are connected by white-translucent membranes, which collectively make the flowers appear pink from a distance. The six-parted calyces are white to rose, densely woolly, and about 1.5 to 3 mm. long. *FRUIT*: a shiny and beaked akene about 2 mm. long. *OCCURRENCE*: widespread and locally common in open and generally grassy habitats in the Tassajara region, especially on steep southfacing slopes. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Siskiyou Co. to Ventura Co., and the Sierra Nevada Foothills, from Butte Co. to Kern Co. ⊛April-July.

⇧**Chorizanthe staticoides** Benthem [*C. s.* var. *mediconalis* (Nuttall) Jepson]. TURKISH RUGGING, TURK'S RUG (p. 145). *HABIT*: annual herbs with one to several erect or ascending and typically upwardly branched stems ranging from about 1 to 2 dm. (4-8") tall. *LEAVES*: strictly basal and produced in rosettes, the petioles about .5 to 3 cm. long, the blades mostly oblong to oblong-ovate, green above and woolly below, and about .5 to 6 cm. long. *INFLORESCENCE*: the flowers are produced in terminal clusters, and solitary flowers are usually present in the axils. *COROLLA*: absent. The spiny-toothed involucres, which are about 3 to 5 mm. long, are tinged reddish or purplish, while the six-parted calyces are deep to light rose-pink or sometimes nearly white, and about 3 to 5 mm. long. *FRUIT*: a narrow akene about 3 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, but uncommon and restricted to open areas with disturbed soils, particularly in openings in chaparral. While I have seen this species only along a recently cleared section of Tony's Trail, in a loosely soiled area in chaparral about half-way down on the Willow Creek side of the grade, Roxana Ferris collected it in disturbed soil along Tassajara Rd. about seven-tenths of a mile north of the hot springs in 1956 (Ferris 13018 DS), Vern Yadon ('80d) reported it from Pine Ridge in 1980, and Miriam Bobcoff found it the vicinity of the hot springs during the early years after the Marble-Cone Fire of 1977. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Monterey Co. to San Diego Co. ⊛April-July.

ERIOGONUM. WILD BUCKWHEAT, FALSE BUCKWHEAT.

About 240 to 250 species ranging from annual herbs to shrubs. *Eriogonum* is the second largest genus that is entirely endemic to North America (primarily western North America), and largest genus in California, for 168 species occur within the state, and 44 of these are endemic to the California Floristic Province. The genus is often taxonomically problematic, probably due to its apparently high degree of evolutionary diversification.

1a. Woody-branched shrubs or subshrubs. Leaves narrowly linear, sessile, and densely foliating the branches. . . . . ***E. fasciculatum***.
1b. Plants herbaceous or woody only at or near the base. Leaves narrowly oblong or elliptic to roundish, mostly petiolate, and basal or primarily restricted to lower portions of the stems or at the lower nodes:
2a. Annual herbs:
3a. Involucres pedunculate, campanulate to broadly turbinate, and not angled or ribbed. Calyces covered with hooked hairs. . . . ***E. inerme***.
3b. Involucres sessile, cylindric to cylindric-turbinate, and angled and/or ribbed. Calyces glabrous or nearly so:
4a. Leaf-blades elliptic to oblong-oblanceolate or oblong-lanceolate. Branches tomentose. Involucres mostly about 2 mm. long. . . . . ***E. gracile***[1].
4b. Leaf-blades roundish to ovate. Stems glabrous or floccose. Involucres mostly about 2.5 to 3.5 mm. long:
5b. Leaves loosely basal and often whorled or opposite at the lower nodes or axils, the blades roundish-ovate to cordate or slightly oblong-ovate. Branches densely to sparsely floccose. . . . . ***E. gracile***[2].
5a. Leaves strictly basal, the blades roundish to reniform. Branches glabrous or nearly glabrous. . . . . ***E. gracile***[3].
2b. Evergreen perennial herbs or subshrubs:
6a. Stems glabrous and commonly fistulous (hollow). . . . . ***E. nudum***.
6b. Stems densely to sparsely woolly and not fistulous:
7a. Plants with often lanky stems up to 18 dm. (6') long. Widely scattered and locally common, especially at lower to intermediate elevations. . . . . ***E. elongatum***.
7b. Plants less than 6 dm. (24") tall. Restricted to rock outcrops, cliffs and talus at intermediate to higher elevations:
8a. Leaves strictly basal (the small bracts of the inflorescence scarcely leaf-like), the blades roundish to broadly obovate or elliptic. Inflorescence paniculate, with the flowers produced in terminal, lateral and axillary clusters. . . . . ***E. saxatile***.
8b. Leaves basal as well as in whorls at the nodes, the blades obovate-spatulate to elliptic. Inflorescence umbellate, with the flowers produced in terminal clusters. . . . . ***E. umbellatum***.

⇧**Eriogonum elongatum** Bentham. SILVER BUCKWHEAT, LONG-STEMMED BUCKWHEAT (p. 145). *HABIT*: white-woolly perennial herbs with erect or ascending and somewhat lanky stems ranging from about 6 to 18 dm. (2-6') long. *LEAVES*: the lower are alternate, petiolate and sheathing up the lower portion of the stems, the blades oblong-lanceolate to narrowly ovate and about 1 to 3 cm. long, while the upper leaves are opposite or whorled at the lower nodes, somewhat reduced, and nearly sessile. *INFLORESCENCE*: the flowers are small and produced in clusters from involucres which are remotely scattered on the slender and elongated upper branches. *COROLLA*: absent, although the corolla-like calyces, which are about 2.5 to 3 mm. long, are mostly white with a pink tinge. *FRUIT*: a dark brown akene about 2 to 3 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, and occurring mostly in open and often rocky habitats. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Monterey and San Benito Counties to northern Baja California. ⊛July-Nov.

Eriogonum fasciculatum Bentham **var. foliolosum** (Nuttall) Stokes. CALIFORNIA BUCKWHEAT, FLAT-TOP (p. 145). *HABIT*: evergreen shrubs typically with rounded crowns comprised of many erect or ascending and densely foliated branches up to 15 dm. (52") long. *LEAVES*: sessile, linear-oblong to linear-oblanceolate with generally inrolled margins, and about 6 to 12 mm. long. *INFLORESCENCE*: the small flowers are borne in dense clusters in often flat topped umbels which terminate the branches. *COROLLA*: absent, although the six-lobed calyces are corolla-like, for they are pinkish-white. The persistent calyces, which are about 2.5 to 3 mm. long, turn rusty-red when dry. *FRUIT*: a lance-ovoid akene about 2 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, and occurring mostly in open areas that are transitional between major habitat types, and on southfacing chaparral slopes that are dominated by smaller shrubs or sub-shrubs. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from the San Francisco Bay area to northern Baja California. ⊛May-July.

Eriogonum gracile Bentham. SLENDER WOOLLY BUCKWHEAT (p. 145). *HABIT*: highly variable annual herbs with one or sometimes several erect and upwardly branching stems ranging from about 1.5 to 6 dm. (6-24") tall. *LEAVES*: mostly or strictly basal, or scattered and sometimes whorled on the lower portions of the stems, and sometimes whorled or opposite (but reduced) in the axils of the first branches, the petioles about 5 to 40 mm. long, the blades elliptic or oblong-lanceolate/oblanceolate to nearly round, about 5 to 30 mm. long, and commonly with crisped margins. *INFLORESCENCE*: the small flowers are produced in clusters that are lateral and terminal on virgate branches. The clusters are subtended by a common involucre. *COROLLA*: absent, although the petal-like calyces, which are six-parted and about 1 to 3 mm. long, range from white to pinkish (often aging yellowish), and the individual segments are with a red midvein. *FRUIT*: a beaked akene about 1 to 2 mm. long. *OCCURRENCE*: widely scattered in open habitats in the Tassajara region, but fairly uncommon. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Napa and Plumas Counties to northern Baja California, and southeastward to Sonora, Mexico. *NOTE*: this is a highly diverse species with many localized variants, some of which may warrant taxonomic recognition. It belongs to the subgenus *Oregonium*, the most taxonomically problematic section of *Eriogonum*, in which many taxa exhibit characteristics which are inconsistent with descriptions in literature, thus suggesting continued genetic interchange between various entities. One or both of these factors appears have a role in the manifestation of the local plants, for three morphologically divergent populations occur in this region, each of which, based on the keys of botanical literature, "key-out" to different entities: *E. gracile*-like plants (1), *E. luteolum* Greene-like plants (2), and *E. davidsonii* Greene-like plants (3) (these groups are segregated in the key to the genus). I have conservatively included all three as variations within *E. gracile*, for plants exhibiting intermediate features are often encountered in this region. It is possible, however, that more than one taxon is involved, and perhaps an unrecognized taxon. 1). Plants which correspond or mostly correspond to typical *E. gracile* are widely scattered (but uncommon) in the Tassajara region. Such plants have leaves with elliptic to oblong-oblanceolate or oblong-lanceolate blades (the margins are often crisped), which are strictly basal or nearly so, and tomentose branches. 2). Plants which "key-out" to *E.*

luteolum are scattered in the vicinity of Tassajara Hot Springs, and extending up to nearly 3,000' along Tony's Trail, and occur mostly in grassy or rocky openings in chaparral. Such plants have leaves with blades which are roundish-ovate or cordate to slightly oblong-ovate, which are produced in loose rosettes and usually scattered a short distance up the stem, Most of these plants also leaves which are whorled (or opposite) between the base and the first branching node, and sometimes opposite (but reduced) leaves in the lower axils; the branches are sparsely to fairly densely floccose. Similar plants also occur in other areas of the Santa Lucia Mts. of Monterey Co., as evidenced by Howitt #990 CAS (from along the trail from Escondido Camp to the Arroyo Seco River), and are likely to represent all of the Monterey Co. populations which Howitt & Howell ('64) assigned to *E. vimineum* Bentham. *E. luteolum* is a species commonly of serpentine which occurs from Santa Clara Co. northward in Coast Ranges, and from Butte Co. northward in the Sierra Nevada, to southern Oregon. 3). Plants which "key-out" to *E. davidsonii* are scattered at higher elevations in the Tassajara region, such as on Pine Ridge, along the Pine Ridge Trail between Tassajara Road and the Church Creek Divide, and on Chew's Ridge. Such plants have leaves with roundish to reniform blades (often with crisped margins) which are strictly basal, and glabrous or nearly glabrous branches. These and similar plants from other high elevation sites in Santa Lucia Mts. of Monterey Co. were accepted as *E. davidsonii* by both Howitt & Howell ('64) and Griffin ('75). *E. davidsonii* is a montane species of the southern Sierra Nevada and mountains of southern California, which extends eastward in mountainous areas to southwestern Utah and northern Arizona. ⊛May-Aug. (-Oct.).

Eriogonum inerme (Watson) Jepson (p. 145). *HABIT*: small annual herbs ranging from about .5 to 3 dm. (2-12") tall, with generally spreading stems which are usually two to three-branched near the base and repeatedly two-branched above. *LEAVES*: the lower leaves are about 1 to 2.5 cm. long, generally spatulate, and taper to an indistinct petiole, while the upper leaves are in two's or three's at the nodes, sessile, generally lanceolate, and usually less than 1 cm. long. The margins are ciliate. *INFLORESCENCE*: the flowers are produced in clusters of four to six from sharply four-lobed involucres which are terminal and axillary in a generally diffuse panicle. *COROLLA*: absent. The six-parted calyces, which are between 1 and 2 mm. long, are pink to red and covered with hooked white hairs. *FRUIT*: a brownish akene about 1.5 to 1.9 mm. long. *OCCURRENCE*: scattered at higher elevations in the Tassajara region, but rare. Although I did not find this taxon in the Tassajara region, Vern Yadon reported it from two localities (gravely areas within the massive sandstone outcrops in the Church Creek area, and "in one spot more or less" on Black Butte in June of 1979, re. Yadon '79 a & b), and Clare Hardham collected it at about 5,000 ft. on Chew's Ridge in June of 1960 (Hardham #6196 CAS). *DISTRIBUTION*: an infrequent species of the Coast Ranges, southern Sierra Nevada, Tehachapi Mts. and Transverse Ranges, from Lake and Tulare Counties to Ventura Co. *NOTE*: Hardham's specimen was originally assigned to *E. hirtiflorum* Gray, and thus may been the basis for the listing of Chew's Ridge as a site for this taxon by Howitt & Howell ('64). ⊛ June-Oct.

Eriogonum nudum Douglas var. **auriculatum** (Bentham) Tracy [*E. latifolium* subsp. *a.* (Bentham) Stokes]. COAST BUCKWHEAT, TIBINAGUA, NAKED-STEMMED BUCKWHEAT. (p. 145). *HABIT*: sometimes woody-based evergreen perennial herbs with stout and commonly fistulous (hollow) stems ranging from about 3 to 15 dm. (1-5') tall. *LEAVES*: produced at or near the base of the stems in loose rosettes, the petioles are about 2 to 10 cm. long, while the blades are oblong to elliptic, about 3 to 7 cm. long, obtuse at the apex and often truncate to subcordate at the base, glabrous or nearly so on the upper surface and woolly on the lower surface, and frequently with crisped margins. *INFLORESCENCE*: the small flowers are produced in clusters from involucres that are solitary or in two's or three's; the involucres are terminal, axillary and occasionally lateral on the branches of an open cymose panicle. *COROLLA*: absent, although the six-parted corolla-like calyces, which are about 2.5 to 3 mm. long, are creamy white with a pinkish tinge, and often becoming yellowish with age. *FRUIT*: an akene about 1.5 to 3.5 mm. long. *OCCURRENCE*: widespread and locally common in the Tassajara region, and occurring mostly in open or semi-open and often rocky places in areas that are more or less transitional between major habitat types. *DISTRIBUTION*: Coast Ranges, from Humboldt Co. to San Luis Obispo Co. *NOTE*: morphological characteristics of many of the plants of this region, especially those from open grasslands and sometimes rocky areas in the Horse Pasture and The Pines, suggest var. *indictum* (Jepson) Reveal of the inner south Coast Ranges. Such plants have very strongly fistulous stems (up to 2 cm. wide), tend to be more densely tufted, and often have a prominent woody base. As the flowers are white to pinkish (not yellow or yellowish), the plants may simply represent a growth form of older and/or more hardy var. *auriculatum* plants, but it is also possible that the plants are to some degree genetically intermediate with var. *indictum*. The possibility of genetic interchange in this region is also indicated by the fact that many (if not most) of the local plants produce fistulous stems (the stems of var. *auriculatum*-like plants usually are not fistulous). ⊛July-Sept.

Eriogonum saxatile Watson. ROCK BUCKWHEAT (p. 147). *HABIT*: white-woolly evergreen perennial herbs with one to several erect or ascending and often woody-based stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: basal and produced in rosettes, the petioles about 1 to 4 cm. long, the blades roundish to broadly obovate or elliptic and about 1 to 2 cm. long. The leaves of older plants are often subtended by a congestion of persistent dead leaves. *INFLORESCENCE*: shortly-branched and cymose terminal panicles, with the small flowers produced in clusters from terminal, lateral and axillary involucres about 3 to 4 mm. long. *COROLLA*: none, although the corolla-like and six-lobed calyces, which are about 3 to 7 mm. long inclusive of the stipe-like base, vary from pinkish to white or yellowish. *FRUIT*: a sharply three-angled akene about 3 to 4 mm. long. *OCCURRENCE*: restricted to rock outcrops, talus and sometimes scree covered slopes at intermediate to higher elevations of the Tassajara region, such as on Black Butte Ridge and the massive sandstone outcrops in the Church Creek and Pine Valley areas. According to Vern Yadon ('79b, '80 e & f), it is also present on the summit of Never-Again Ridge and the Elephant's Back. *DISTRIBUTION*: scattered in mountainous regions mostly between 3,000 and 10,000 ft., from Mt. Hamilton and Mt. Umumhum (Santa Clara Co.) in the Coast Ranges, and from the mountains of southern Nevada and adjacent California east of the Sierra Nevada, to the Transverse Ranges (Santa Barbara Co. to San Bernardino Co.) and northeastern Peninsular Ranges (the San Jacinto Mts. of Riverside Co.) ⊛May-July.

Eriogonum umbellatum Torrey var. **bahiiforme** (Torrey & Gray) Jepson. SULFUR FLOWER (p. 147). *HABIT*: densely tomentose perennial herbs or subshrubs with decumbent to ascending lower branches and generally erect flowering stems less than 6 dm. (24") tall. *LEAVES*: petiolate and clustered on the lower branches, the blades obovate-spatulate to elliptic and about 1 to 1.5 cm. long. *INFLORESCENCE*: umbel-like, with the flowers produced in terminal clusters. *COROLLA*: absent, although the corolla-like and six-parted calyces, which are about 5 to 8 mm. long, are bright yellow and often reddish-tinged with age. *FRUIT*: a sharply three-angled akene about 2 to 5 mm. long. *OCCURRENCE*: according to Griffin ('75), this taxon is uncommon on the Pine Ridge-Bear Basin serpentine outcrop above 1200 m. (3937'), where it was first discovered by Steven Talley in 1972. As this taxon is sometimes found on non-serpentine outcrops, it is possible that it occurs on talus or scree slopes elsewhere in this region. *DISTRIBUTION*: an uncommon plant primarily of serpentine outcrops of the Coast Ranges, from Glenn and Lake Counties to San Benito and Monterey Counties. ⊛July-Sept.

POLYGONUM. KNOTWEED, SMARTWEED.

A widely distributed (but primarily northern temperate) genus of about 300 species.

Polygonum lapathifolium Linnaeus. WILLOW SMARTWEED, WILLOW WEED, (p. 147). *HABIT*: annual herbs with erect or ascending stems ranging from about 5 to 15 dm. (20-60") tall. *LEAVES*: alternate and short-petiolate, the blades are linear-lanceolate to oblong-lanceolate, entire, and about 5 to 20 cm. long. *INFLORESCENCE*: the flowers are small and crowded on the spike-like and often nodding branches of an open panicle, and the four-parted calyces vary from rose-pink to purplish or whitish. *FRUIT*: lenticular akenes about 1.8 to 2.2 mm. long; the akenes are enveloped within the calyces. *OCCURRENCE*: rare in the Tassajara region; only few plants were seen in the bed of Tassajara Creek near Adobe Camp. *DISTRIBUTION*: widespread in temperate North America. ⊛June-Oct.

PTEROSTEGIA. FAIRY MIST.

One species of western North America.

Pterostegia drymarioides Fischer & Meyer (p. 147). *Habit*: delicate vine-like annual herbs with several prostrate and freely branching stems ranging from about 1 to 5 dm. (4-20") long. *LEAVES*: opposite, remote and petiolate, the often reddish-tinged blades are broadly obovate to roundish or reniform, deeply notched to entire at the apex, and about .5 to 2 cm. long. *INFLORESCENCE*: the flowers are less than 2 mm. long, monoecious, and produced in two's or three's in the axils of the leaves. *FRUIT*: a beaked akene about 1.5 mm. long which is loosely enclosed by the enlarging and scarious bracts of the pistillate flowers. *OCCURRENCE*: widely scattered in the Tassajara region, and locally common on shady slopes (especially in rocky areas), but inconspicuous and easily overlooked. *DISTRIBUTION*: from southwestern Oregon and southwestern Utah to northern Baja California, and on the Channel Islands and the islands off the coast of Baja California, as far south as Guadalupe Island. ⊛March-July.

RUMEX. SORREL, DOCK.

About 200 species of northern temperate regions.

1a. Plants rhizomatic and forming spreading tufts. Lower leaves hastate. Flowers dioecious. . . . . ***R. acetosella.***
1b. Plants taprooted and not forming tufts. Leaves linear to oblong-lanceolate or elliptic. Flowers perfect:
2a. Stems erect. Leaves basal and cauline, oblong to oblong-lanceolate or elliptic, and with strongly crisped margins. . . . . ***R. crispus.***
2b. Stems decumbent to ascending. Leaves cauline, linear to linear-lanceolate, and not crisped. . . . . ***R. salicifolius.***

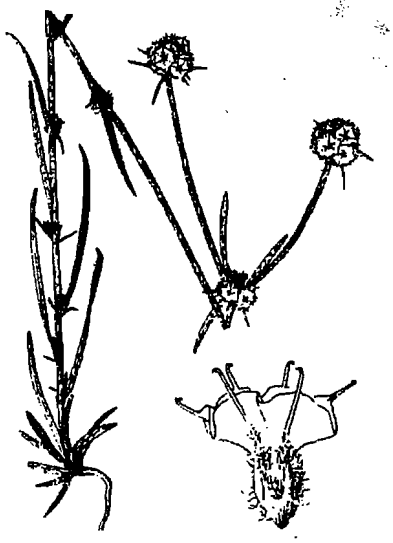
***Rumex acetosella** Linnaeus. SHEEP SORREL (p. 147). *HABIT*: rhizomatic perennial herbs with erect or decumbent stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: alternate, the lower rather crowded, long-petiolate, and with hastate or basally two-lobed blades about 2 to 6 cm. long, while the reduced upper-most leaves are short petiolate to sessile, generally linear-lanceolate, and entire. *INFLORESCENCE*: the small and petalless flowers are produced in whorls on the branches of an open panicle. The often reddish-tinged perianth segments are about 1 to 2 mm. long. *FRUIT*: an akene about as long as the generally adherent perianth. *OCCURRENCE*: occasional in (often moist) areas that have had much exposure to human activities, such as in the old streambed depression between the developed area of Tassajara Hot Springs and The Flats (where the new bathhouse is located), at turnouts along Tassajara Road, and sometimes at campsites. *DISTRIBUTION*: a common weed in temperate North America; native to Eurasia. ⊛March-Aug.

***Rumex crispus** Linnaeus. CURLY DOCK (p. 129). *HABIT*: taprooted perennial herbs with erect stems ranging from about 5 to 12 dm. (20-48 in.) tall. *LEAVES*: alternate and petiolate, the blades oblong to oblong-lanceolate or oblong elliptic with strongly crisped margins, and about 10 to 25 cm. long. *INFLORESCENCE*: the petalless flowers, which are about 4 to 6 mm. long, are produced in closely spaced whorls on the branches of an open panicle; the panicle turns reddish-brown with the maturation of the fruits. *FRUIT*: an akene about 2 mm. long which is surrounded by the three inner perianth segments. *OCCURRENCE*: scattered on the floodplains of Tassajara Creek in the vicinity of Tassajara Hot Springs, both upstream and downstream, and occasionally at turnouts along Tassajara Road. *DISTRIBUTION*: a common weed in temperate North America; native to Eurasia. ⊛ May-July.

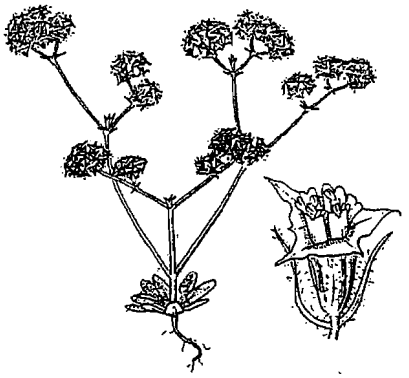
Rumex salicifolius Weinmann. WILLOW DOCK (p. 147). *HABIT*: perennial herbs with decumbent to ascending stems ranging from about 3 to 9 dm. (12-36") long. *LEAVES*: alternate and short-petiolate, the blades linear to linear-lanceolate, and about 3 to 12 cm. long. *INFLORESCENCE*: the petalless flowers, which are about 2 to 3 mm. long, are clustered on the branches of open panicles about 15 to 30 cm. long. *FRUIT*: a three-angled akene about 2 to 3 mm. long; the akene is surrounded by the persistent inner perianth segments. *OCCURRENCE*: rare in the Tassajara region, and known to occur only in generally wet habitats in Pine Valley and on Chew's Ridge. *DISTRIBUTION*: from northern California and western Nevada to northern Baja California; inclusive of the many subspecies, the taxon is widely distributed in western North America, from Alaska to Mexico. ⊛May-Sept.

Notes on *Polygonaceae*.

I was not able to locate two *Polygonaceae* species that were among A. D. E. Elmer's "Tassajara Hot Springs" specimens of June 1901: *Systenotheca vortriedei* (*Chorizanthe v.*) (Elmer #3244 DS, etc.) and *Chorizanthe clevelandii* (Elmer #3245 DS, etc.). Both specimens were cited in Goodman's monograph of the genus ('34), and thus probably served as the basis of the listing of "Tassajara Springs" as a Monterey Co. site for both taxon by Howitt & Howell ('64); the specimens were also cited by Reveal & Hardham ('89 a & b). Although Elmer's "Tassajara Hot Springs" specimens usually include notes enclosed in envelopes pasted to the sheets which state the location of collection, the *Systenotheca vortriedei* specimen was apparently on loan at the time I reviewed the holdings at the California Academy of Sciences Herbarium in San Francisco, and the only specimen on file of *Chorizanthe clevelandii* appeared to be a duplicate (it had neither an envelope or the distinctive preprinted label of Elmer's primary Tassajara Hot Springs specimens). I suspect that Elmer collected both specimens in or near Lost Valley (about 5½ linear miles south of Tassajara Hot Springs). Both species also occur in Hanging Valley, about 5½ linear miles southeast of Tassajara Hot Springs. *Systenotheca vortriedei* (Santa Lucia Spine-Flower) is a rare and very unique species that is endemic to the Santa Lucia Mts. of Monterey and San Luis Obispo Counties, and is the only species of the genus *Systenotheca*. It is an annual herb similar to *Chorizanthe*, with strictly basal leaves, freely branching stems, and with involucres that are produced singularly in the axils and at

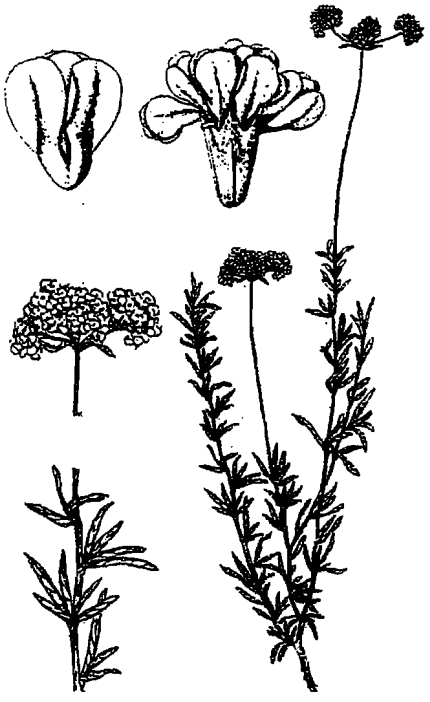


Chorizanthe membranacea



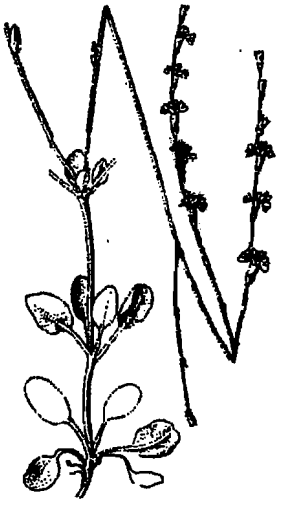
Chorizanthe staticoides

Eriogonum gracile (1)



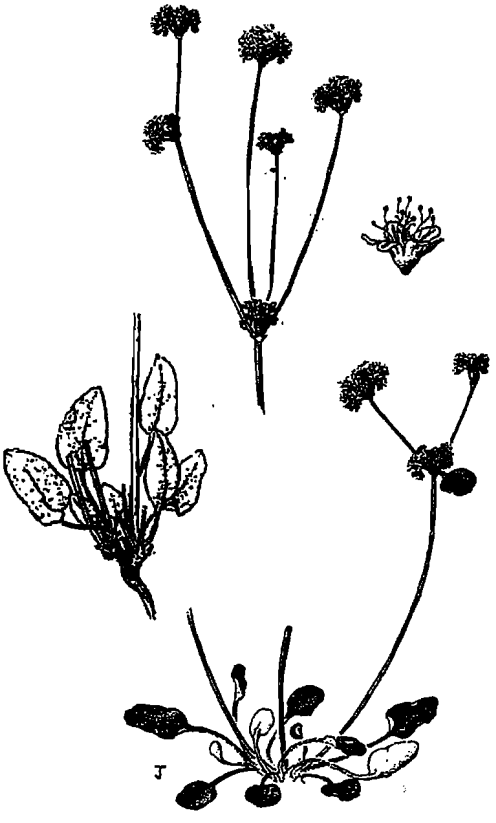
Eriogonum fasciculatum

Eriogonum elongatum

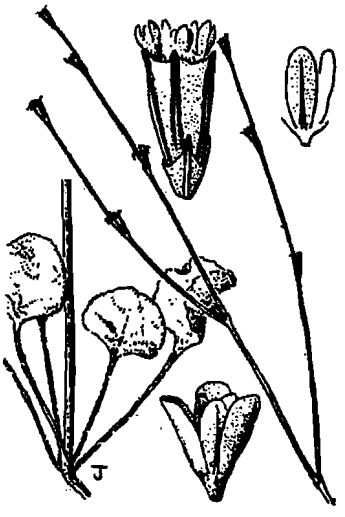


Eriogonum gracile (2)

Eriogonum inerme



Eriogonum nudum



Eriogonum gracile (3)

the nodes. This taxon can be distinguished from the local representatives of *Chorizanthe* by the singular and deeply three or four lobed bracts at the nodes, and by involucres that are always singular and four-sided. The much more widely distributed *Chorizanthe clevelandii* can be readily distinguished from the two common local representatives of the genus (*C. douglasii* and *C. membranacea*) by the absence of membranous tissue between the involucre spines, and from the (locally) uncommon *C. staticoides* in having very strongly unequal involucre teeth (the larger four or more times longer than the smaller), and by fimbriate (as opposed to entire) inner perianth segments.

Native *Polygonaceae* species that are reported to occur in areas near or relatively near to the Tassajara region include: *Chorizanthe biloba*, *Eriogonum butterworthianum* (a rare Santa Lucia Mts. endemic), *E elegans*, *E nortonii*, *E. roseum*, *E. spergulinum* var. and *E. viridescens* (Howitt & Howell '64 & '73).

PORTULACACEAE. PURSLANE FAMILY.

About 19 or 20 genera and roughly 400 to 575 species of annual and perennial herbs. The family is represented nearly worldwide, but the species are primarily of the temperate regions of the Americas, Australia and South Africa. Many of the species have succulent or semi-succulent foliage, and some are edible.

1a. Leaves primarily basal, the cauline leaves opposite and fused or partially fused into a conspicuous disk or kidney shaped and involucre-like structure subtending the inflorescence. . . . . ***Claytonia.***
1b. Leaves basal and cauline, the cauline few to many, alternate, and narrowly linear to oblanceolate or obovate:
2a. Petals red to purplish-red or rose-pink, and about 3 to 10 (-15) mm. long. Styles 3-branched. Capsules 3-valved. . . . . ***Calandrinia.***
2b. Petals white to pink and about 1 to 3 mm. long. Styles unbranched or absent (the stigmas sessile). Capsules 2-valved. . . ***Calyptridium.***

CALANDRINIA. RED MAIDS.

About 150 species of the Americas and Australia.

1a. Capsules oblong and about twice as long as the calyx lobes. Leaf development strongly accentuated towards the base of the plant. . . . . ***C. breweri.***
1b. Capsules ovoid and barely exceeding the calyx lobes. Leaf development not strongly accentuated towards the base of the plant. . . . . ***C. ciliata.***

Calandrinia breweri Watson. CHAPARRAL RED MAIDS (p. 147). *HABIT*: annual herbs with several semi-prostrate to ascending branches ranging from about 1 to 4 dm. (4-16") long. *LEAVES*: alternate, semi-succulent, entire and about .5 to 6 cm. long, the lower larger, fairly crowded and narrowly oblong-oblanceolate to spatulate, the upper becoming reduced, fairly remote, and linear to linear-oblanceolate. *INFLORESCENCE*: the flowers are scattered in elongated terminal racemes. *COROLLA*: (usually) five red to purplish-pink petals about 3 to 5 mm. long. *FRUIT*: an oblong and many-seeded capsule about 6 to 12 mm. long. *OCCURRENCE*: rare in the Tassajara region, and restricted to openings in chaparral where the soil is loose or disturbed, or sometimes in sandy-soiled areas on floodplains or in washes. As this is a well noted "burn-species", it likely to much more common in this region during the first few years after a fire. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Sonoma and Mariposa Counties to northern Baja California. ⊛March-June.

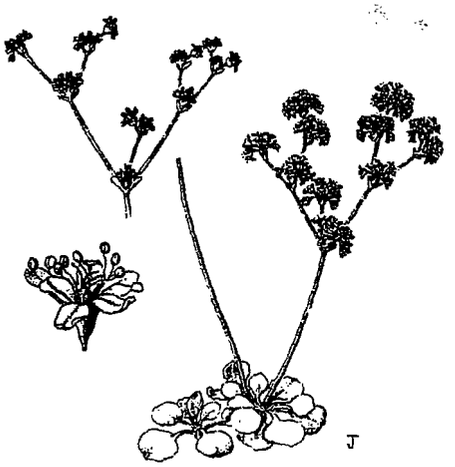
Calandrinia ciliata (Ruiz, Lopez & Pavon) deCandolle [*C. c.* var. *menziesii* (Hooker) Macbride, *C. caulescens* Humboldt, Bonpland & Kunth var. *m.* Gray]. COMMON RED MAIDS (p. 147). *HABIT*: annual herbs usually with several semi-prostrate to ascending branches ranging from about 1 to 4 dm. (4-16") long. *LEAVES*: alternate, semi-succulent, entire, and about 1 to 10 cm. long, the lower longer and mostly narrowly oblanceolate, the upper mostly linear. *INFLORESCENCE*: the flowers are scattered in leafy terminal racemes. *COROLLA*: (usually) five petals about 4 to 10 (-15) mm. long, which range from pale pinkish-red to deep purplish-red. *FRUIT*: an ovoid and many-seeded capsule about 4 to 7 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, and occurring mostly in open grasslands or grassy openings in woodlands. *DISTRIBUTION*: from British Columbia to northwestern South America. ⊛Feb.-April.

CALYPTRIDIUM. PUSSYPAWS.

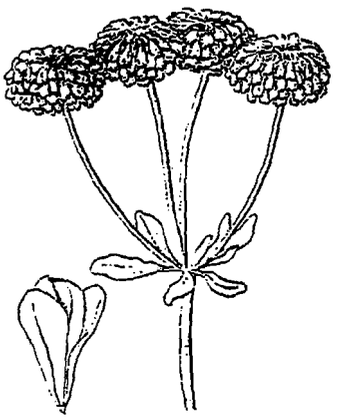
Eight species of western North America.

1a. Capsules more than twice as long as the sepals. Leaves primarily basal. . . . . ***C. monandrum.***
1b. Capsules less than twice as long as the sepals. Leaves not primarily basal. . . . . ***C. parryi.***

Calyptridium monandrum Nuttall. SAND CRESS (p. 149). *HABIT*: small and semi-succulent annual herbs with several prostrate to ascending branches ranging from about 5 to 18 cm. (2-7") long. *LEAVES*: entire and about 1 to 5 cm. long, the basal generally larger, produced in rosettes, and mostly narrowly oblanceolate to spatulate, while the generally few and fairly remote cauline leaves are mostly obovate. *INFLORESCENCE*: the flowers are small and produced on one side of terminal and axillary racemes or panicles about 1 to 4 cm. long. *COROLLA*: three white to pink or reddish petals about 1 to 3 mm. long. *FRUIT*: a linear-oblong and 5 to 10 seeded capsule about 3 to 6 mm. long. *OCCURRENCE*: this well-noted "burn-species" is apparently widely scattered in the Tassajara region, but currently rare. Although I have seen only a few plants in openings in chaparral along the spine of Black Butte Ridge, Vern Yadon reported it be common on Black Butte and scattered on the summit of "Never-Again Ridge" in June of 1979, less than two years after the Marble-Cone Fire of 1977 (Yadon '79 a & b). A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3242 DS) was collected, according to a note enclosed in an envelope pasted to the sheet, at "Springs, in sand," presumably in a sandy-soiled area along the floodplains of Tassajara Creek in the vicinity of the hot springs. *DISTRIBUTION*: southwestern North America, from Monterey and San Benito Counties in the Coast Ranges, the southern Sierra Nevada, and the Modoc Plateau of northeastern California, southward through the Great Basin and deserts of Nevada, California and Arizona, to Sonora, Mexico. ⊛March-June.

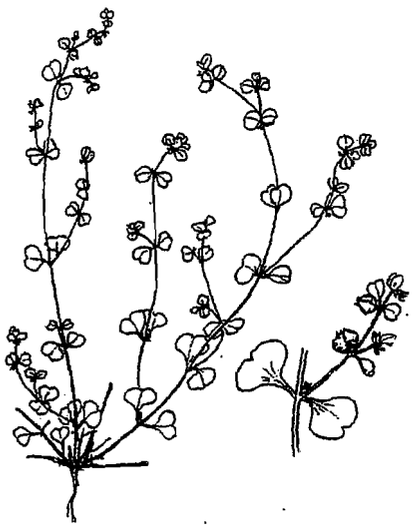


Eriogonum saxatile



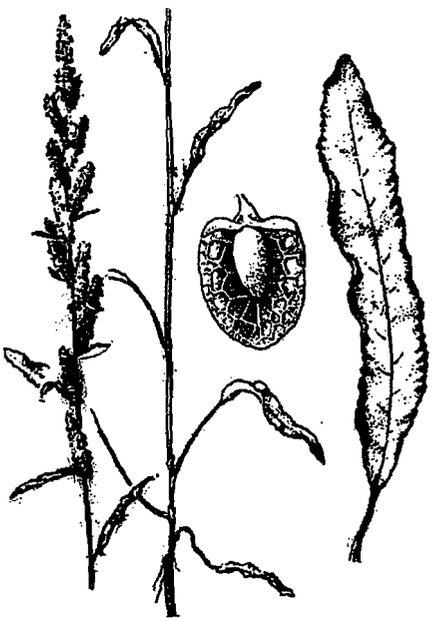
Eriogonum umbellatum

Polygonum lapathifolium



Pterostegia drymarioides

Rumex acetosella



Rumex crispus

Rumex salicifolius

Calandrinia breweri

Calandrinia ciliata

Calyptridium parryi Gray var. **hesseae** Thomas. SANTA CRUZ MOUNTAINS PUSSYPAWS (p. 149). *HABIT*: small and semi-succulent annual herbs with several prostrate to ascending stems ranging from about 2 to 15 cm. (1-6") long. *LEAVES*: oblanceolate to spatulate, entire, and about 1 to 3 cm. long, the lower-most in rosettes and the upper alternate. *INFLORESCENCE*: the flowers are small and produced on one side of terminal and axillary racemes or panicles about 1 to 3.5 cm. long. *COROLLA*: three white petals about 1.5 to 3 mm. long. *FRUIT*: an ovate to oblong and 10 to 15 seeded capsule about 3 to 7 mm. long. *OCCURRENCE*: known to occur in this region only in open areas on Chew's Ridge (in the vicinity of the junction of Tassajara Road and the road to the Chew's Ridge lookout and MIRA Observatory). *DISTRIBUTION*: an uncommon plant of the Santa Cruz Mountains (Santa Cruz and Santa Clara Counties), Mt. Hamilton (Santa Clara County), San Benito Mountain (San Benito County), and the Santa Lucia Mountains (Monterey County). ⊛June-July.

CLAYTONIA. MINER'S LETTUCE, SPRING BEAUTY.

About 28 species of North America and eastern Asia.

1a. Basal leaves linear to narrowly oblanceolate, the blades indistinct or gradually narrowing to the petiole, and more than 3 times longer than wide:
2a. Cauline leaves free or partially fused on one side, the sections narrowly ovate to narrowly linear. Seeds dull-black. . . . . ***C. exigua.***
2b. Cauline leave fused on both sides, the sections forming a more or less disk-like structure. Seeds shiny black. . . . . ***C. parviflora.***
1b. Blades of basal leaves elliptic to reniform, less than 3 times longer than wide to wider than long, and wedge-shaped to cordate at the base:
3a. Plants reddish or pinkish throughout. Cauline leaves fused only on one side of the stem. . . . . ***C. rubra.***
3b. Plants green (or yellowish or reddish with age). Cauline leaves fused on both sides of the stem:
4a. Blades of basal leaves generally longer than wide, the base wedge-shaped, the apex obtuse to acute. . . . . ***C. perfoliata perfoliata.***
4b. Blades of basal leaves commonly wider than long, the base truncate to cordate, the apex abruptly acute. . . . . ***C. perfoliata mexicana.***

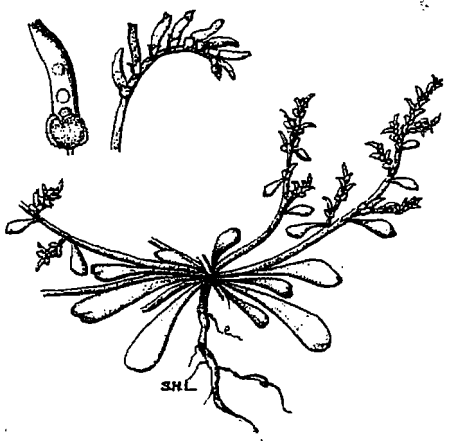
Claytonia exiqua Torrey & Gray [*C. spathulata* Douglas ex Hooker var. *exiqua* (Torrey & Gray) Robinson] (p. 149). *HABIT*: small annual herbs with erect or spreading stems ranging from about 1 to 15 cm. (.5-6") long. *LEAVES*: the basal leaves, which are produced in rosettes, are linear to linear-spatulate and about 3 to 9 (-12) cm. long, while the two cauline leaves are opposite, free or fused on one side, narrowly ovate to linear, and about 1 to 2 cm. long. *INFLORESCENCE*: the flowers are produced in terminal racemes. *COROLLA*: five white or pinkish petals about 2 to 5 mm. long. *FRUIT*: a three-valved capsule about 1.5 to 2.5 mm. long. *OCCURRENCE*: according to Griffin ('75) this species is uncommon on Chew's Ridge and rare on Pine Ridge. *DISTRIBUTION*: western North America, from British Columbia to the Transverse and Peninsular Ranges of southern California. ⊛Feb.-May.

Claytonia parviflora Hooker [*Montia perfoliata* (Donn ex Willdenow) Howell forma *parviflora* (Douglas) Howell]. MINIATURE MINER'S LETTUCE (p. 149). *HABIT*: small annual herbs with erect or ascending stems ranging from about .5 to 3 dm. (2-12") tall. *LEAVES*: primarily basal and produced in rosettes, narrowly linear to narrowly oblanceolate and often grass-like, and about 1 to 18 cm. long (inclusive of the petiole). The two cauline leaves are opposite and fused into a disk-like structure subtending the inflorescence. *INFLORESCENCE*: the flowers are borne in terminal racemes which become elongated in age. *COROLLA*: five white or sometimes pinkish petals about 2 to 6 mm. long. *FRUIT*: a three-valved capsule about 1.5 to 4 mm. long. *OCCURRENCE*: widely scattered and locally common to abundant in the Tassajara region, particularly in sandy or gravely soil in the partial shade of shrubs. *DISTRIBUTION*: widely distributed in western North America, from British Columbia and Montana to northern Mexico. ⊛Jan.-June.

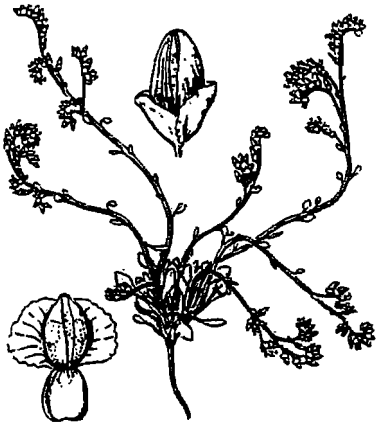
Claytonia perfoliata Donn ex Willdenow [*Montia p.* (Donn ex. Willdenow) Howell]. MINER'S LETTUCE (p. 149). *HABIT*: distinctive annual herbs with erect or ascending stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: primarily basal and produced in rosettes, about 1 to 25 cm. long (inclusive of the petiole), the blades elliptic to deltate. The two cauline leaves are fused into a roundish and involucre-like structure subtending the inflorescence. *INFLORESCENCE*: the flowers are small and produced in terminal racemes that become elongated with age. *COROLLA*: five white or sometimes pinkish petals about 2 to 6 mm. long. *FRUIT*: a three-seeded capsule about 1.5 to 4 mm. long. *OCCURRENCE*: widespread and locally common to abundant in shady or generally shady habitats in the Tassajara region. *DISTRIBUTION*: common and often weedy in western North America, from British Columbia and Montana to northern Baja California, and a naturalized weed in Europe, Australia, New Zealand and probably other areas. ⊛Jan.-June.

Claytonia perfoliata subsp. **mexicana** (Rydberg) Miller & Chambers. ROBUST MINER'S LETTUCE (p. 149). *HABIT*: similar to the typical species, except for the broadly deltoid to reniform and abruptly acute blades of the basal leaves. Such plants also tend to be more robust in all forms of growth. *OCCURRENCE*: widely scattered in shady woodland habitats in the Tassajara region, but much less common than the typical species. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from northwestern California to Central America. ⊛Feb.-May.

Claytonia rubra (Howell) Tidestrom [*Montia perfoliata* var. *depressa* (Gray) Jepson misapplied]. RED MINER'S LETTUCE (p. 149). *HABIT*: small and distinctly succulent annual herbs with many erect or ascending flowering stems ranging from about 1 to 15 cm. (.3-6") tall. The entire plant is red to rose-pink. *LEAVES*: basal leaves are about 1 to 8 cm. long and produced in rosettes, the blades generally less than 2 cm. long and broadly deltoid. The two cauline leaves are fused on one side, and the outer corners are generally squarish. *INFLORESCENCE*: short terminal racemes of 3 to 30 flowers. *COROLLA*: five white to pink petals about 2 to 3.5 mm. long. *FRUIT*: a three-valved capsule about 2 to 3 mm. long. *OCCURRENCE*: common in the mixed evergreen forest along the Pine Ridge Trail from the trail-head on Tassajara Road to the first summit to the west, and occasionally on Chew's Ridge. Larger and less succulent but often reddish-tinged plants from Chew's Ridge, with small deltoid blades and deeply cleft cauline leaves, may represent hybrids between *C. rubra* and another element of the *C. perfoliata* complex. *DISTRIBUTION*: widespread in western North America, from British Columbia to South Dakota, Colorado and the mountains of southern California, and apparently occurring mostly between 4,000 and 7,500 ft. elevation (Munz '59). ⊛March-May.

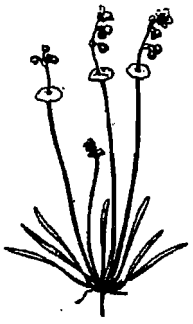


Calyptridium monandrum



Calyptridium parryi hesseae

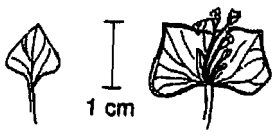
Claytonia exiqua



Claytonia parviflora

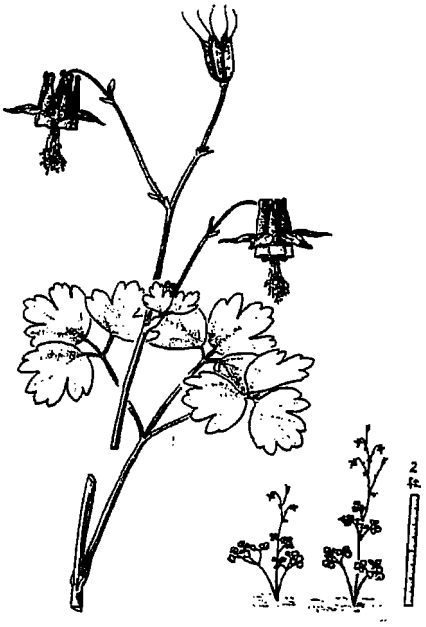
Claytonia perfoliata

Claytonia perfoliata mexicana



Claytonia rubra

Dodecatheon clevelandii



Aquilegia formosa

PRIMULACEAE. PRIMROSE FAMILY.

About 28 genera and 800 species primarily of northern temperate regions, especially in Eurasia. Well known genera include *Primula* (the primroses), *Trientalis* (star-flower) and *Cyclamen*.

1a. Leaves cauline and opposite. Flowers produced singularly in the axils of the leaves. Corolla not reflexed. . . . . ***Anagallis***.
1b. Leaves basal and produced in rosettes. Flowers produced in terminal umbels. Corolla reflexed. . . . . ***Dodecatheon***.

ANAGALLIS. PIMPERNEL.

About 20 species primarily of Eurasia.

***Anagallis arvensis** Linnaeus. SCARLET PIMPERNEL, POOR-MAN'S WEATHER GLASS (p. 149). *HABIT*: annual herbs usually with several decumbent to ascending branches ranging from about 1 to 2.5 dm. (4-10") long. *LEAVES*: sessile, opposite, generally ovate with entire margins, and about .5 to 2 cm. long. *INFLORESCENCE*: the flowers are produced singularly in the axils of the leaves, the pedicels are slender and about 1 to 3 cm. long. *COROLLA*: about 8 to 10 mm. wide, cleft into five broad lobes, and reddish-orange to salmon. The corollas open when exposed to full sunlight, but close when its dark or cloudy. *FRUIT*: a roundish and many-seeded capsule about 3 to 4 mm. wide. *OCCURRENCE*: scattered in grassy habitats, but mostly in areas that have been used as forage grounds, such as in the vicinity of The Caves and the Horse Pasture. Also scattered around the developed area of Tassajara Hot Springs, and occasionally along trails and at campsites. *DISTRIBUTION*: a common weed in North America; native to Eurasia. ⊛March-July.

DODECATHEON. SHOOTING STARS, MOSQUITO BILLS, SAILOR CAPS.

About 14 species of North America. Eight species occur in California, and two are endemic to the California Floristic Province, including the *D. clevelandii* complex, which includes at least four lesser taxa.

Dodecatheon clevelandii Greene subsp. **sanctarum** (Greene) Abrams. PADRES SHOOTING STARS (p. 149). *HABIT*: annual herbs with erect flowering stems ranging from about 1.2 to 4 dm. (5-16") tall. *LEAVES*: strictly basal and produced in rosettes, about 2 to 6 cm. long (inclusive of the petioles), the blades broadly oblanceolate to spatulate, and mostly with crisped and/or irregularly crenate margins. *INFLORESCENCE*: terminal umbels comprised of about 3 to 7 flowers which face downward or downwardly on deflexed pedicels about 2 to 5 cm. long (the pedicels turn upward with the maturation of the fruits). *COROLLA*: reflexed and with five generally oblong-acute lobes about 1 to 2 cm. long. The lobes are generally rose-lavender, while the tubes are with three bands of color, the upper white, the central yellow, and the lower blackish-purple and with a light spot at the base of each anther. The stamens are united around the longer pistil, thus forming the "mosquito bill". *FRUIT*: a many-seeded capsule about 8 to 13 mm. long. *OCCURRENCE*: widely scattered and locally common to abundant on open grassland slopes at lower to intermediate elevations in the Tassajara region, but apparently absent above about 4,000 ft. *DISTRIBUTION*: outer Coast Ranges and western Transverse Ranges, from San Francisco to the Santa Monica Mts. of western Los Angeles Co. ⊛Jan.-April (-May).

RANUNCULACEAE. BUTTERCUP FAMILY.

A diverse family comprised of about 60 genera and approximately 1,700 species worldwide, with most of the species occurring in temperate and boreal Eurasia and North America. The family is a source of many ornamental plants.

1a. Climbing or trailing vines, sometimes semi-woody. Petals absent, although the sepals are white, and petal-like in texture. . . ***Clematis***.
1b. Plants not vine-like and never woody:
2a. Petals absent, sepals greenish-white to purplish. . . . . ***Thalictrum***.
2b. Petals present (calyces in *Aquilegia* and *Delphinium* are petal-like in color and texture, and more conspicuous than the petals in *Delphinium*):
3a. Petals yellow; nectar glands fully exposed. Akenes fully exposed. . . . . ***Ranunculus***.
3b. Petals not yellow or only partially yellow (*Aquilegia*); nectar-glands concealed in spur-like formations. Akenes enclosed in follicles:
4a. Leaves lobed or deeply cleft into linear segments, but not divided into distinct leaflets. Flowers asymmetrical with the calyces more conspicuous than the corollas. Nectar-bearing petal spurs two, but enclosed within a spur-like upper sepal. . . . . ***Delphinium***.
4b. Leaves divided into distinct leaflets. Flowers symmetrical with the corollas more conspicuous than the calyces. Nectar-bearing petal spurs five, and not enclosed within the sepals. . . . . ***Aquilegia***.

AQUILEGIA. COLUMBINE.

About 70 species of temperate North America and Eurasia.

Aquilegia formosa Fischer [*A. f.* var. *truncata* (Fischer & Meyer) Baker, *A. t.* F. & M.]. CRIMSON COLUMBINE (p. 149). *HABIT*: perennial herbs from a thick caudex which annually produces erect or ascending stems ranging from about 5 to 10 dm. (20-40") tall. *LEAVES*: the basal and lower cauline leaves are borne on petioles up to 3 dm. long, with the blades biternately divided into cuneate-obovate and irregularly lobed leaflets about 2 to 4 cm. long. Upper leaves are much reduced, sessile, simple or divided into three generally lanceolate segments. *INFLORESCENCE*: the flowers are showy and generally face downward on long axillary and terminal pedicels. *SEPALS & COROLLA*: the five petal-like sepals are scarlet and spread outward, while the five petals, which are about 1 to 2 cm. long, are yellow at the opening, but the tubular spur that protrudes backward between the sepals is scarlet. *FRUIT*: a follicle about 15 to 25 mm. long. *OCCURRENCE*: lightly scattered in wet or seasonally wet (and usually shady) habitats along Church Creek, the upper regions of Tassajara Creek, Oryoki Creek, along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, in Pine and Strawberry Valleys, and probably in Miller's Canyon. *DISTRIBUTION*: western North America, from Alaska to Utah and northern Baja California. ⊛April-Aug.

CLEMATIS. VIRGIN'S BOWER.

A widely distributed genus of about 250 species.

1a. Leaves divided into 3 (or rarely 5) leaflets. Flowers usually singular on long axillary peduncles. Sepals 1.5-2.5 cm. long. Plants mostly of chaparral habitats. . . . . ***C. lasiantha.***

1b. Leaves divided into 5 to 7 leaflets. Flowers many in cymose panicles. Sepals no more than 1 cm. long. Plants of wet and shady habitats, or sometimes dwarfed in deeply shady but not wet habitats. . . . . ***C. ligusticifolia.***

Clematis lasiantha Nuttall. PIPE-STEM, CHAPARRAL VIRGIN'S BOWER (p. 154). *HABIT*: semi-shrubby vines with climbing branches as much as 5 m. (16') long. *LEAVES*: opposite, the petioles about 2 to 5 cm. long and commonly twining, the blades divided into three (or sometimes five) generally ovate and variously toothed or lobed leaflets about 2 to 5 cm. long. *INFLORESCENCE*: the flowers are produced singularly or in two's or three's on long axillary peduncles about 4 to 12 cm. long. *COROLLA*: none, although the sepals, which are up to 2.5 cm. long, are white and petal-like in texture. *FRUIT*: numerous akenes with persistent and plumose styles about 2.5 to 4 cm. long; collectively the styles form spherical head-like clusters in maturity. *OCCURRENCE*: widely scattered in the Tassajara region, mostly in chaparral, but generally uncommon, although plants can be quite numerous in small areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Shasta Co. to northern Baja California. ⊛March-June.

Clematis ligusticifolia Nuttall. WESTERN VIRGIN'S BOWER, YERBA DE CHIVATO (or CHIVA) (p. 154). *HABIT*: perennial vines sometimes with trailing branches just a few decimeters long, but more commonly with semi-woody branches ranging to as much as 15 m. (50') long, which can climb high into the branches of trees. *LEAVES*: opposite, the petioles about 3 to 7 cm. long and commonly twining, the blades divided into 5 to 7 lance-ovate, irregularly toothed and often three-lobed leaflets about 2 to 8 cm. long. *INFLORESCENCE*: the flowers are produced in cymose panicles on axillary peduncles about 3 to 10 cm. long. *COROLLA*: none, although the sepals, which are about 6 to 10 cm. long, are white and petal-like in texture. *FRUIT*: many small akenes with persistent feather-like styles about 2 to 4 cm. long. *OCCURRENCE*: widely scattered and locally forming thickets in wet and usually shady habitats in the Tassajara region, and sometimes (in a depauperate form) in deeply shady but otherwise dry habitats, such as under dense stands of arborescent *Ceanothus* chaparral. *DISTRIBUTION*: western North America, from British Columbia to northern Baja California and New Mexico. ⊛March-Aug.

DELPHINIUM. LARKSPUR.

About 250 species of northern-temperate perennial herbs.

1a. Sepals and petals scarlet-red. . . . . ***D. nudicaule.***

1b. Sepals blue or purplish-blue, petals blue or white with blue or purplish-blue veins:

2a. Ultimate leaf-segments relatively broad (mostly about 4 to 12 mm. wide). Petals white or whitish with blue lines. Primary stem narrowed at the base and weakly attached to the root. . . . . ***D. patens.***

2b. Ultimate leaf-segments narrowly linear (rarely more than 4 mm. wide, and often less than 1 mm. wide). Upper petals white or whitish with purplish-blue lines towards the apex, lower petals blue or purplish-blue. Primary stem not narrowed at the base, and strongly attached to the root. . . . . ***D. parryi.***

⇩**Delphinium nudicaule** Torrey & Gray. RED LARKSPUR (p. 154). *HABIT*: perennial herbs from elongated rootstocks that annually produce erect or ascending (and often branching) stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: alternate and mostly produced on the lower third of the stems, the petioles of the lower-most up to 15 cm. long while those of the upper leaves become increasingly reduced in length. The blades are semi-succulent, generally deltoid to reniform in outline and about 3 to 10 cm. wide, those of the lower leaves larger and deeply divided into three major sections, the central section three-lobed at the apex while the lateral sections are usually cleft into two major lobes which are two to four lobed at the apex. The blades of the upper leaves become increasingly reduced in size and complexity, with the upper-most typically divided into three broadly to narrowly lanceolate and simple segments. *INFLORESCENCE*: the showy flowers are produced on slender pedicels in open and spike-like racemes. *CALYX & COROLLA*: both the calyx (which is about 2 to 2.5 cm. long inclusive of the spur) and the four smaller petals are bright red to crimson. *FRUIT*: a many-seeded follicle about 12 to 25 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and occurring mostly on deeply shady (and often rocky) woodland slopes. *DISTRIBUTION*: from southwestern Oregon to the Santa Lucia Mts. of northwestern San Luis Obispo Co. in the Coast Ranges, and to Mariposa Co. in the Sierra Nevada. ⊛March-May.

Delphinium parryi Gray [*D. p.* subsp. *seditiosum* (Jepson) Ewan]. WESTERN LARKSPUR (p. 154). *HABIT*: perennial herbs from woody roots that annually produce erect or ascending stems ranging from about 3 to 9 dm. (12-36") tall. *LEAVES*: alternate and mostly restricted to the lower half of the plant, the lower larger and on longer petioles (up to 15 cm. long), the blades reniform to deltoid in outline, about 3 to 12 cm. wide, and deeply divided into three to five narrowly linear and simple or (usually) irregularly lobed segments. *INFLORESCENCE*: the flowers are produced in elongated terminal racemes on pedicels about .5 to 3 cm. long. *CALYX & COROLLA*: the calyces, which are about 1 to 2 cm. long (inclusive of the spur) and two lower petals are blue or slightly purplish-blue, while the two upper petals are basically white, but purplish-blue veined at the apex. *FRUIT*: a many seeded follicle about 10 to 15 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, mostly in semi-open woodland habitats. *DISTRIBUTION*: Coast Ranges and coastal southern California, from Santa Clara Co. to northern Baja California and the Channel Islands. ⊛April-May.

Delphinium patens Bentham [*D. decorum* Fischer & Meyer var. *p.* (Bentham) Gray]. WOODLAND LARKSPUR (p. 154). *HABIT*: perennial herbs from tuber-like rootstocks that annually produce erect or ascending stems ranging from about 2 to 5 dm. (8-20") tall. *LEAVES*: alternate and produced mostly on the lower third of the stems, the lower larger and on longer petioles (up to 16 cm. long), the blades deltoid to more or less roundish in outline, about 4 to 9 cm. wide, and deeply parted into (usually) five major divisions that are mostly two to four lobed or cleft at the apex (the blades of the upper-most leaves are usually divided into simple segments). *INFLORESCENCE*: the flowers are produced on elongated and spike-like terminal racemes on pedicels about 1 to 4 cm. long. *CALYX & COROLLA*: the calyces, which are about 1 to 2 cm. long (inclusive of the spur), are mostly a bright medium blue, while the four small petals are basically white or whitish and with blue veins. *FRUIT*: an oblong and many-seeded follicle about 1 to 2 cm. long. *OCCURRENCE*: widespread and locally

common at lower to intermediate elevations of the Tassajara region, and occurring mostly in shadier areas of semi-open woodland habitats. *Distribution*: Coast Ranges, from Lake Co. to northern Santa Barbara Co., and the Sierra Nevada Foothills, from Butte Co. to El Dorado Co. ⊛March-May.

RANUNCULUS. Buttercup.

About 250 species of perennial and annual herbs of temperate and montane tropical regions.

1a. Showy-flowered perennial herbs usually more than 3 dm. (1') tall. Petals 7 to 22 and about 5 to 15 mm. long. . . . . ***R. californicus***.
1b. Inconspicuously-flowered annual herbs no more than 3 dm. tall. Petals absent or less than 6, and not more than 2 mm. long. . . . . ***R. hebecarpus***.

Ranunculus californicus Bentham. California Buttercup (p. 154). *Habit*: perennial herbs with clustered roots which annually produce erect or ascending (and usually branching) stems ranging from about 3 to 7 dm. (12-28") tall. *Leaves*: alternate, the lower generally larger, long petiolate, and with blades ovate to orbicular in outline, up to 8 cm. long, and divided into three to five major leaflets or lobes which are further lobed or toothed. The middle leaves have shorter petioles and blades which vary from palmately to pinnately divided into narrow and irregularly lobed segments, while the upper-most leaves are sessile and with blades divided into three or four narrow and entire segments. *Inflorescence*: the showy flowers are mostly singular and terminal on the upper branches. *Corolla*: about 7 to 22 yellow petals about 5 to 15 mm. long. The petals have a distinctive glossy sheen on the upper surface, and nectar-bearing glands near the base. *Fruit*: about 5 to 35 beaked akenes about 2 to 2.5 mm. long. *Occurrence*: widely scattered and locally common in the Tassajara region, and occurring mostly in semi-open woodlands and seasonally moist grasslands, but absent in the vicinity of Tassajara Hot Springs, the Horse Pasture, and The Pines. *Distribution*: Coast, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California, and the Sierra Nevada Foothills, from Amador Co. to Madera Co. ⊛February-May.

Ranunculus hebecarpus Hooker & Arnott. Downy Buttercup (p. 154). *Habit*: small and rather inconspicuous annual herbs with slender and erect or ascending stems ranging from about .5 to 3 dm. (2-12") tall. *Leaves*: alternate, the lower long petiolate and with blades that are deltoid to orbicular in outline, about .5 to 2.5 cm. long, and palmately (or sometimes irregularly) divided or lobed (the lobes generally three-lobed at the apex). The upper-most leaves are short-petiolate and simple or cleft into three oblong-lanceolate segments up to 3 cm. long. *Inflorescence*: the small flowers are produced singularly on very slender axillary and terminal pedicels up to 2.5 cm. long. *Corolla*: absent or of up to five yellow petals about 1 to 2 mm. long; the petals often fall before the flowers are mature. *Fruit*: about 3 to 11 gibbous akenes about 2 mm. long. *Occurrence*: widespread in shady or semi-shady habitats in the Tassajara region, primarily in woodlands or in grassy openings in arborescent chaparral. The plants commonly occur in groups in moisture retaining depressions. *Distribution*: from Washington and Idaho to northern Baja California. ⊛March-May.

THALICTRUM. Meadow Rue.

About 80 species of temperate North America, Eurasia and Africa.

Thalictrum fendleri Gray var. **polycarpum** Torrey [*T. p.* (Torrey) Watson] (p. 154). *Habit*: perennial herbs from a short caudex which annually produces erect and hollow stems ranging from about 6 to 20 dm. (2-6') tall. *Leaves*: the lower long-petiolate and the upper often subsessile, the blades three to four times ternately divided into ovate to cuneate and variously toothed or lobed leaflets about .5 to 2 cm. long. *Inflorescence*: the flowers are produced in fairly open panicles terminating the main stem and lateral branches. *Corolla*: absent. The sepals are greenish-white to purplish. *Fruit*: the ovaries mature into 7 to 20 akenes about 4 to 8 mm. long. *Occurrence*: scattered in moist and usually shady habitats along streams in Pine Valley, Miller's Canyon and Strawberry Valley, and probably along Church Creek. *Distribution*: Cascades, Coast Ranges, Sierra Nevada (where uncommon), Transverse and Peninsular Ranges, from southern Washington to San Diego Co. ⊛April-July.

RHAMNACEAE. Buckthorn Family.

About 55 genera and 900 species of trees, shrubs and vines. The family is particularly well represented in tropical and subtropical regions.

1a. Flowers produced in showy terminal and lateral clusters. Petals dark blue to white, slender clawed, and generally longer than the sepals. Seeds produced in dry capsules. . . . . ***Ceanothus***.
1b. Flowers produced in axillary clusters. Petals absent or white, not clawed, and shorter than the sepals. Seeds produced in berry-like drupes. . . . . ***Rhamnus***.

CEANOTHUS. California Lilac, Blue Blossom.

About 45 species of temperate western North America, but mostly of California. Forty-two species occur within the boundaries of the state, and 38 are endemic to the California Floristic Province. Of the five taxa that are known to occur in the Tassajara region, four are widespread and common to very abundant, and, as a whole, they dominate most of the chaparral habitats.

1a. Leaves generally opposite, cuneate-obovate to oblong, entire, obtuse to truncate or emarginate at the apex. Stipules thick, corky, and persistent. Capsule lobes crested with prominent horn-like appendages. . . . . ***C. cuneatus***.
1b. Leaves generally alternate, ovate to oblong-linear, the margins ranging from entire to serrate or revolute and/or crisped, and acute to obtuse at the apex, or if apparently truncate or emarginate, it is due to revolute margins. Stipules thin and readily deciduous. Capsule lobes rounded or with low ridges or crests at the apex:
2a. Leaves ovate to broadly elliptical with three or more major veins, mostly acute, and with flat and entire or finely serrate margins:

3a. Leaves with finely serrate margins and three prominent veins diverging from the base. Petals dark to light blue or sometimes nearly white. . . . . ***C. oliganthus***.
3b. Leaves with entire margins and a more or less pinnate vein structure. Petals white. . . . . ***C. integerrimus***.
2b. Leaves narrowly oblong to elliptical and with only one major vein, mostly obtuse to truncate, and with revolute and/or crisped margins:
4a. Largest leaves usually more than 1.5 cm. long, mostly oblong to elliptic, the upper surface very glandular and with prominent wart-like formations. . . . . ***C. papillosus***.
4b. Largest leaves usually less than 1.5 cm. long, mostly oblong to linear, the upper surface commonly not glandular, and if with wart-like formations, they are small and fairly inconspicuous. . . . . ***C. dentatus***.

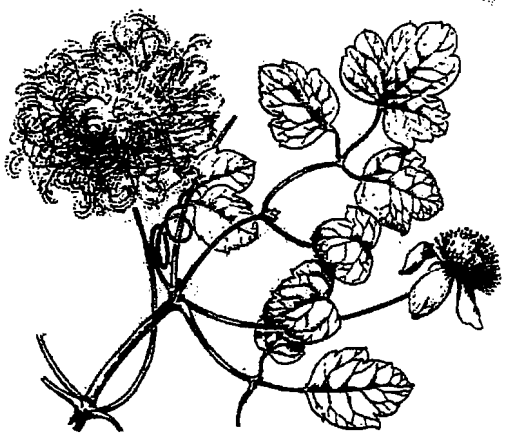
Ceanothus cuneatus (Hooker) Nuttall [*C. ramulosus* (Greene) McMinn]. BUCK BRUSH (p. 154). *HABIT*: evergreen shrubs ranging from about 1.2 to 3.5 m. (4-12') tall, with a fairly rigid habit of growth and smooth whitish to greenish-gray bark. *LEAVES*: opposite and short-petiolate to nearly sessile, the blades cuneate-obovate to spatulate, obtuse to truncate and often notched at the apex, and about .5 to 1.5 cm. long. *INFLORESCENCE*: the small and very fragrant flowers are borne in showy terminal and axillary clusters. *COROLLA*: five small and slender-clawed petals which are usually white but sometimes are pale bluish or lavender. *FRUIT*: a roundish three-lobed capsule about 4 to 6 mm. long. *OCCURRENCE*: locally common in chaparral at lower to intermediate elevations in the Tassajara region, and forming nearly pure stands in some areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. This is the most widespread and abundant *Ceanothus* species in California. ⊛March-May.

Ceanothus dentatus Torrey & Gray. CROP-LEAF CEANOTHUS, DWARF CEANOTHUS, SAND SCRUB (p. 156). *HABIT*: fairly rigidly branched evergreen shrubs ranging from about .5 to 1.5 m. (20-60") tall. *LEAVES*: alternate and often clustered, short-petiolate to nearly sessile, the blades mostly about 5 to 12 mm. long, oblong to linear, and truncate to notched at the apex due to strongly revolute and gland-toothed margins. *INFLORESCENCE*: the flowers are produced roundish terminal and lateral clusters about 1 to 2 cm. long. *COROLLA*: five small, deep blue, and narrowly-clawed petals. *FRUIT*: a subglobose capsule about 4 mm. wide. *OCCURRENCE*: lightly scattered in chaparral along the summit of Black Butte and around Lime Point. Although this species was not found elsewhere in this region, it may be more widely distributed, for the plants are relatively short and are often obscured by larger shrubs. *DISTRIBUTION*: from the Santa Cruz Mts. of Santa Cruz Co. to the Santa Lucia Mts. of Monterey and San Luis Obispo Counties. *NOTE*: McMinn ('42) believed that a specimen collected by Mildred Mathias in 1937 (Mathias #1314) from "ridge south of China Camp on the Tassajara Hot Springs Road" represented the ornamental *C. d.* var. *microphyllus* Hortorum of English gardens. ⊛March-June.

Ceanothus integerrimus Hooker & Arnott. DEER BRUSH, WHITE CEANOTHUS (p. 156). *HABIT*: evergreen or semi-deciduous shrubs ranging from about 1 to 4 m. (3.3-13') tall in chaparral habitats to as much as 7 m. (23') or more in woodlands or arborescent chaparral. The trunks and branches are greenish or yellowish-gray. *LEAVES*: alternate, the petioles are about 6 to 12 mm. long, and the blades are ovate to oblong-elliptic with entire margins, and about 2 to 7 cm. long. *INFLORESCENCE*: the flowers are small but produced in abundance in showy and generally conically-shaped terminal and lateral paniculate clusters about 4 to 15 cm. long. *COROLLA*: five small, white and narrowly clawed petals. *FRUIT*: a roundish three-lobed capsule about 4 to 5 mm. wide. *OCCURRENCE*: widely distributed in the Tassajara region, and common to abundant both as an understory in woodlands and as a dominate member of chaparral habitats (except on southfacing slopes). On north northfacing slopes this species can form dense stands, which can be nearly pure or mixed with the equally abundant *C. oliganthus sorediatus*; such stands can have canopies averaging more than 6 m. (20') in height. *DISTRIBUTION*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Washington to San Diego Co. ⊛May-June.

Ceanothus oliganthus Nuttall var. **sorediatus** (Hooker & Arnott) Hoover [*C. sorediatus* Hooker & Arnott]. JIM BRUSH (p. 156). *HABIT*: evergreen shrubs ranging from about 1.5 to 7 m. (5-23') tall. The trunks and branches are relatively smooth and generally grayish-green. *LEAVES*: alternate and with petioles about 2 to 5 mm. long, the blades mostly ovate to broadly elliptic with finely serrate margins, dark-green and semi-glossy above and paler below, and about 1 to 4 cm. long. *INFLORESCENCE*: the flowers are small but produced in showy terminal and lateral clusters about 1 to 4 cm. long. *COROLLA*: five small and narrowly clawed petals ranging from dark to light blue or sometimes nearly white. *FRUIT*: a three-lobed capsule about 4 mm. wide. *OCCURRENCE*: widespread and common to abundant in the Tassajara region, and in regards to the number of extant plants, this may be the most common of woody plant species in this region. It is particularly abundant on north or generally northfacing slopes, as an understory in woodland habitats, and can form dense and nearly pure stands (or be mixed with *C. integerrimus*) of arborescent shrubs that often exceed 6 m. (20') in height (trails which transect such areas tend to be deeply shady and tunnel-like, and require regular maintenance to remain passable). It is also common, although in a less robust form, in chaparral habitats and in transitional areas. *DISTRIBUTION*: Coast, western Transverse and northwestern Peninsular Ranges, from Humboldt Co. to the Santa Ana Mts. of Orange and Riverside Counties. *NOTE*: some of the plants of this region, with more densely pubescent twigs and upper leaf surfaces, approach the description of the typical species. ⊛March-May.

Ceanothus papillosus Torrey & Gray var. **roweanus** McMinn. WART-LEAF CEANOTHUS, BENNIE BUSH (p. 156). *HABIT*: densely foliated evergreen shrubs with rounded to semi-prostrate crowns ranging from about .3 to 2.5 m. (1-8') tall. *LEAVES*: alternate and with petioles about 2 to 6 mm. long, the blades mostly narrowly oblong-elliptic, about 1 to 5 cm. long, and with revolute, contorted, and glandular-toothed margins. The upper surface is very glandular and dotted with prominent wart-like formations. *INFLORESCENCE*: the flowers are small but produced in dense and showy terminal and lateral clusters about 2 to 5 cm. long. *COROLLA*: five small and narrowly clawed petals that are an intense deep-blue. *FRUIT*: a three-lobed capsule about 3 to 4 mm. wide. *OCCURRENCE*: widely scattered and locally common to abundant at higher to intermediate elevations of the Tassajara region, particularly on ridge tops and southfacing slopes, where it often forms nearly pure stands. Plants growing on ridge tops are often less than 5 dm. tall and with spreading to semi-prostrate branches, perhaps in response to higher winds and/or the weight of winter snows, while plants occurring in shady canyon bottoms are often quite tall and have larger leaves, and thus approach the typical species (which occurs mostly on the coastal slopes of the Santa Lucia and Santa Cruz Mts.). *DISTRIBUTION*: Coast Ranges, western Transverse and northwestern Peninsular Ranges, from Monterey and San Benito Counties to the Santa Ana Mts. of Orange Co. ⊛Feb.-June.



Clematis lasiantha

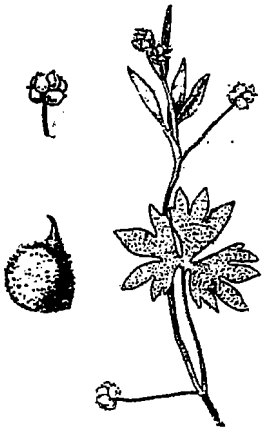
Clematis ligusticifolia

Delphinium nudicaule

Delphinium parryi

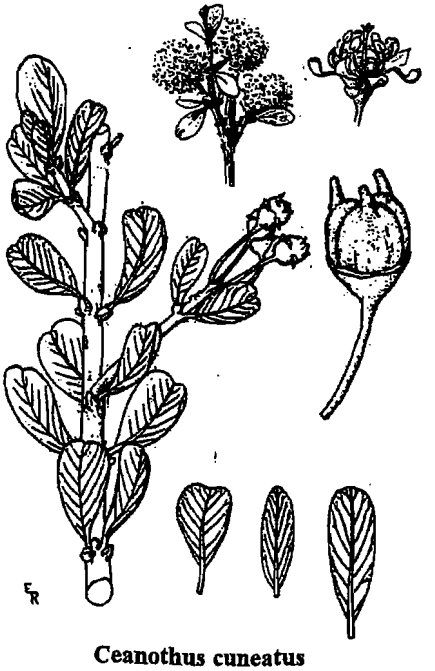
Delphinium patens

Ranunculus californicus



Ranunculus hebecarpus

Thalictrum fendleri



Ceanothus cuneatus

RHAMNUS. BUCKTHORN.

A primarily temperate genus comprised of about 125 species of shrubs or small trees.

1a. Leaves broadly ovate to roundish, less than 4 cm. long, and with spiny-toothed margins. Terminal bud covered with scales. Petals absent, style exserted. Fruits red. . . . . ***R. ilicifolia.***

1b. Leaves oblong-elliptic to lance-oblong, up to 10 cm. long, and with finely serrate or entire margins. Terminal bud not covered with scales. Petals present, style included. Fruits purplish-black:

2a. Lower leaf surface glabrous and shiny, and about the same color as the upper surface. . . . . ***R. californica.***

2b. Lower leaf surface a dull and pale gray-green due a layer of minute woolly hair (magnification is necessary to see the individual hairs), and sharply contrasting with the glabrous and olive-green upper surface. . . . . ***R. tomentella.***

Rhamnus californica Eschscholtz. CALIFORNIA COFFEE-BERRY (p. 156). *HABIT*: evergreen shrubs or sometimes small trees with generally open and rounded crowns ranging from about 2 to 6 m. (6.5-20') tall. *LEAVES*: alternate and with petioles about 3 to 10 mm. long, the blades broadly oblong to elliptic, about 3 to 10 cm. long and 1.5 to 4.5 cm. wide, and with finely serrate or entire and (usually) slightly revolute margins. *INFLORESCENCE*: the small flowers are borne in axillary umbellate clusters of 6 to 50 flowers. *COROLLA*: five white and obcordate petals less than 2 mm. long. *FRUIT*: roundish and deep purplish-black drupes about 1 to 1.5 cm. wide. The fruits mature in late summer to early fall. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, and occurring mostly as an understory in mixed evergreen and riparian woodland habitats, but also in transitional areas and occasionally in chaparral. *DISTRIBUTION*: outer Coast Ranges, western Transverse Ranges, and northwestern Peninsular Ranges, from Siskiyou Co. to San Diego Co. ⊛ May-July.

Rhamnus ilicifolia Kellogg [*R. crocea* Nuttall subsp. *i.* (Kellogg) Wolf]. RED BERRY, HOLLY-LEAFED RED BERRY, RED-BERRIED BUCKTHORN (p. 156). *HABIT*: evergreen shrubs ranging from about 1.2 to 4 m. (4-13') tall. *LEAVES*: alternate and with petioles about 2 to 10 mm. long, the blades fairly stiff, ovate to roundish with spiny-toothed margins, and about 1 to 3 (-4) cm. long. *INFLORESCENCE*: axillary clusters comprised of small and reddish-tinged flowers. *COROLLA*: absent. *FRUIT*: two-seeded and more or less roundish drupes about 4 to 8 mm. long; the drupes are covered with a thin and semi transparent red skin. *OCCURRENCE*: widespread and locally common in the Tassajara region, and occurring mostly in chaparral, open woodlands, and in transitional areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Siskiyou County to northern Baja California, and eastward, in mountainous regions, to Arizona. ⊛March-June.

Rhamnus tomentella Bentham [*R. californica* subsp. *t.* (Bentham) Wolf]. HOARY COFFEE BERRY (p. 156). *HABIT*: evergreen shrubs typically with rounded crowns ranging from about 1.2 to 4 m. (4 to 13') tall. *LEAVES*: alternate and with petioles about 3 to 10 mm. long, the blades mostly oblong-lanceolate to elliptic, olive-green above and pale gray-green below (due to a coat of minute woolly hairs that are discernible only under magnification), about 3 to 7 cm. long and .5 to 2 cm. wide, and with entire and slightly thickened margins. *INFLORESCENCE*: the flowers are small and produced in axillary clusters. *COROLLA*: five white and obcordate petals less than 2 mm. long. *FRUIT*: generally roundish and dark purplish-black drupes about 10 to 12 mm. wide. *OCCURRENCE*: widespread and locally common in the Tassajara region, and occurring mostly in chaparral or in transitional areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Trinity and Shasta Counties to northern Baja California. ⊛May-July.

Note on *Rhamnaceae*.

According to McMinn ('42), *Ceanothus foliosus* var. *medius* was once collected on Chew's Ridge by Rimo Bacigalupi (Bacigalupi #2363), and thus should be looked for in this region. Occasionally plants are encountered in the Tassajara region in which the leaves have wavy and/or toothed margins which are thus suggestive of *C. foliosus*, but the leaves of all of the closely observed plants were with three prominent veins, and thus most likely represent hybrids between *C. oliganthus sorediatus* and *C. papillosus*.

ROSACEAE. ROSE FAMILY.

A large and diversified family of trees, shrubs and herbs comprised of about 100 genera and 3,000 species. The family is the source of many common fruits, such as apples, pears, quinces, loquats, plums, prunes, cherries, peaches, nectarines, apricots, strawberries, raspberries and blackberries. The family is also the source of many ornamental plants, such as *Cotoneaster*, *Pyracantha*, and the many varieties of roses (*Rosa*).

1a. Plants with thorns and/or bristles on the stems or branches:

2a. Leaves mostly palmately divided. Fruits coalescent drupelets (blackberries). Petals white. . . . . ***Rubus.***

2b. Leaves pinnately divided. Fruits fleshy, ripened floral tubes (rose-hips). Petals rose-pink. . . . . ***Rosa.***

1b. Plants without thorns or bristles:

3a. Non-woody perennial herbs less than 8 dm. (32") tall:

4a. Leaves palmately divided into three leaflets. Fruits conical receptacles becoming soft and moist in maturity (a strawberry). . . ***Fragaria.***

4b. Leaves pinnately divided into 5 to 32 leaflets. Fruits dry akenes. . . . . ***Potentilla.***

3b. Shrubs or subshrubs usually much more than 8 dm. tall:

6a. Leaves narrowly linear to linear-oblanceolate and rarely more than 1 cm. long. . . . . ***Adenostoma.***

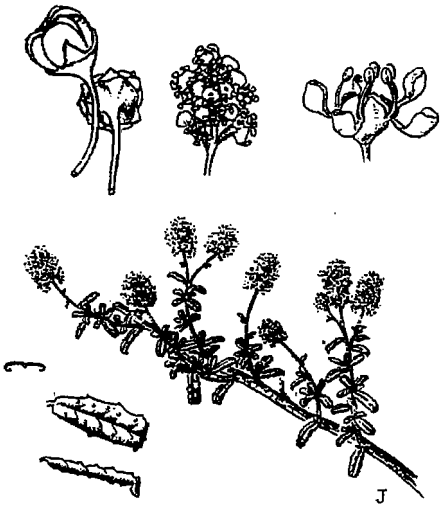
6b. Leaves not narrowly linear rarely less than 1 cm. long:

7a. Leaves 10 to 15 cm. wide, roundish in outline, and palmately cleft into five major lobes. . . . . ***Rubus.***

7b. Leaves usually less than 5 cm. wide, of various shapes, entire or toothed, and if lobed, then the lobes pinnate:

8a. Ovaries inferior, the fruit a pome (i.e., apple-like in structure):

9a. Leaves evergreen, elliptic to oblong-lanceolate, and the margins sharply toothed throughout. Pome red, rather dry, and waxy. Common. . . . . ***Heteromeles.***



Ceanothus dentatus

Ceanothus integerrimus

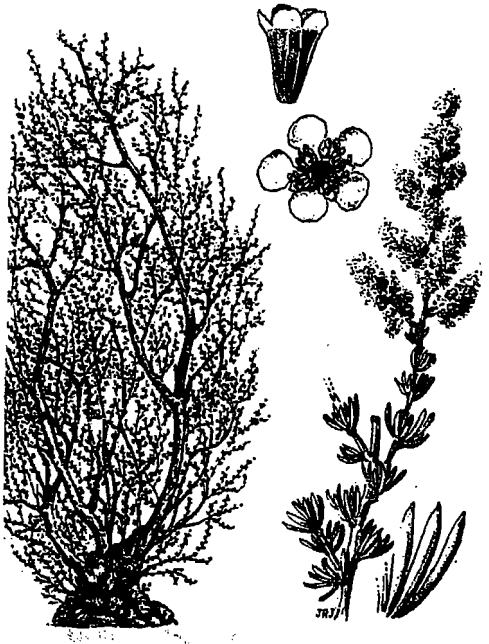
Ceanothus oliganthus sorediatus

Ceanothus papillosus

Rhamnus californica

Rhamnus ilicifolia

Rhamnus tomentella



Adenostoma fasciculatum

Amelanchier utahensis

9b. Leaves deciduous, elliptic or oval to roundish or broadly obovate, and entire or toothed in the outer half. Pome purplish-black and moist. Rare. . . . . ***Amelanchier.***

8b. Ovaries superior, the fruit not a pome:

10a. Fruit a red and fleshy drupe with one relatively large and stone-like seed. . . . . ***Prunus.***

10b. Fruit not a drupe:

11a. Flowers produced singularly or in small groups. Petals absent. Styles very long, plume-like, and very conspicuous. . . ***Cercocarpus.***

11b. Flowers produced in abundance in terminal panicles. Petals present. Styles small and inconspicuous. . . . . ***Holodiscus.***

ADENOSTOMA. CHAMISE AND RED SHANKS.

Two species of the California Floristic Province.

Adenostoma fasciculatum Hooker & Arnott. CHAMISE, GREASE-WOOD (p. 156). *HABIT*: densely foliated evergreen shrubs with erect or ascending branches ranging from about .6 to 3 m. (2-10') tall. The plants develop fire-resistant burls with age, and the branches are covered with a reddish-brown and shredding bark. *LEAVES*: produced mostly in alternate clusters, short petiolate or nearly sessile, the blades linear to linear-oblanceolate, and about 4 to 10 mm. long. *INFLORESCENCE*: the flowers are small and produced on the racemose branches of terminal panicles. *COROLLA*: five white and roundish petals about 1.5 mm. long. *FRUIT*: a hardened capsule-like floral tube which encloses the akenes. *OCCURRENCE*: widespread in chaparral habitats in the Tassajara region, and common to abundant in drier habitats, such as on steep southfacing slopes, where it is often the dominate species. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Humboldt and Shasta Counties to northern Baja California. *NOTE*: this species is noted for its allelopathic properties, for the plants inhibit the growth of nearby plants via the emission of toxic chemicals. ⊛May-June.

AMELANCHIER. SERVICE BERRY.

About 10 species of temperate North America, Eurasia and North Africa.

Amelanchier utahensis Koehne [*A. pallida* Greene] (p. 156). *HABIT*: deciduous shrubs ranging from about 1 to 4 m. (1.3-13') tall. *LEAVES*: alternate and with petioles about 6 to 12 mm. long, the blades elliptic or oval to roundish or broadly obovate, about 1.5 to 4.5 cm. long, and the margins are entire or toothed in the outer half. *INFLORESCENCE*: the flowers number about 3 to 8 in corymbose racemes about 1 to 4 cm. long. *COROLLA*: five white and elliptic to wedge-shaped petals about 5 to 11 mm. long. *FRUIT*: a purplish-black and berry-like pome about 4 to 10 mm. in diameter. *OCCURRENCE*: occasional along streams on the north slope of Chew's Ridge, but not known to occur else-where in the Tassajara region. *DISTRIBUTION*: western North America, from Oregon and Montana to northern Baja California and Texas. ⊛April-June.

CERCOCARPUS. MOUNTAIN MAHOGANY, HARD-TACK.

About 13 species of western North America.

Cercocarpus betuloides Nuttall. COMMON MOUNTAIN MAHOGANY, BIRCH-LEAF HARD-TACK (p. 159). *HABIT*: evergreen shrubs ranging from about 1.2 to 3+ m. (4-10'+) tall; the branches that are covered with a smooth and grayish bark. *LEAVES*: alternate or produced in small groups, the petioles about 1 to 10 mm. long, the blades obovate to oval or broadly elliptic, cuneate and entire below and serrate towards the apex, dark-green above and pale below, and about 1 to 2.5 cm. long. *INFLORESCENCE*: the flowers are terminal and axillary, and produced singularly or in small clusters. *COROLLA*: none. *FRUIT*: floral tubes about 8 to 14 mm. long, with cylindric akenes about 8 to 12 mm. long. The akenes have persistent, plume-like, and generally twisting styles about 5 to 9 cm. long. *OCCURRENCE*: widespread and locally common in the Tassajara region, and occurring primarily in chaparral or in transitional areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southwestern Oregon to northern Baja California. ⊛March-May.

FRAGARIA. STRAWBERRY.

About 15 to 30 species primarily of northern temperate regions.

Fragaria vesca Linnaeus [*F. v.* subsp. *californica* (Chamisso & Schlechtendal) Staudt, *F. c.* C. & S.]. WOOD STRAWBERRY, COMMON WILD STRAWBERRY (p. 159). *HABIT*: perennial herbs with short rhizomes and more or less prostrate stolons. The flowering stems range from about 1 to 2.5 dm. (4-10") tall. *LEAVES*: basal and with petioles about 3 to 12 cm. long, the blades divided into three roundish-obovate and coarsely serrate leaflets about 2 to 5 cm. long. *INFLORESCENCE*: the showy flowers are produced singularly or in few-flowered terminal cymes. *COROLLA*: five white and roundish-obovate petals about 5 to 8 mm. long. *FRUIT*: an enlarged, red, fleshy and generally conical receptacle (strawberry) about 1 cm. long, with small akenes produced on the surface. *OCCURRENCE*: common shady and/or moist habitats in Strawberry Valley and locally common in similar habitats in Pine Valley, and scattered on shady woodland slopes along the Marble Peak Trail in the upper regions of Willow Creek (between Willow Springs Camp and the Willow Creek Divide) and in the vicinity of China Camp (and probably Miller Canyon). *DISTRIBUTION*: widely distributed in northern temperate Eurasia and North America. In California it is scattered in the Coast Ranges, from Del Norte Co. to Santa Barbara Co., and in the Sierra Nevada, from Siskiyou Co. to Tulare Co., and again in the mountains of southern California and northern Baja California. ⊛March-June.

HETEROMELES. TOYON, CALIFORNIA CHRISTMAS BERRY.

One species of the California Floristic Province. The botanical name means "different apple," and refers to the somewhat apple-like fruits.

Heteromeles arbutifolia (Aiton) Roemer [*Photinia a.* Lindley] (p. 159). *HABIT*: evergreen and grayish-barked shrubs ranging from about 2 to 5 m. (6.5-16') tall, or rarely small trees up to 10 m. (33') tall. *LEAVES*: alternate and with petioles about 1 to 2 cm. long, the blades elliptic to oblong-lanceolate with serrate margins, dark-green above and paler below, and about 4 to 10 cm. long. *INFLORESCENCE*: the

flowers are relatively small and crowded in terminal corymbose panicles. *COROLLA*: five white petals about 2 to 4 mm. long. *FRUIT*: a ovoid, waxy, and red-skinned pomes about 5 to 10 mm. in diameter. *OCCURRENCE*: widespread and locally common in the Tassajara region, and occurring mostly in chaparral or in transitional areas. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Siskiyou and Shasta Counties to northern Baja California. *NOTE*: this species is most conspicuous from late fall to early winter, when the panicles are adorned with numerous red fruits. ⊛May-June.

HOLODISCUS.

Five species of western North America, Central America and northern South America.

Holodiscus discolor (Pursh) Maximowicz [*H. d.* var. *franciscanus* (Rydberg) Jepson]. OCEAN SPRAY, CREAM-BUSH (p. 159). *HABIT*: deciduous shrubs with somewhat lanky branches ranging from about 1 to 2.5 m. (3.3-8') tall, or rarely up to 6 m. (20') tall. *LEAVES*: alternate or clustered on short lateral stems, the petioles about .5 to 2 cm. long, the blades about 1 to 8 (-12) cm. long, ovate to elliptic or obovate, subtruncate to cuneate at the base, and with shallowly lobed and coarsely toothed margins. *INFLORESCENCE*: flowers are small and crowded in terminal panicles about 4 to 25 cm. long. *COROLLA*: five oval and creamy off-white petals about 2 mm. long. *FRUIT*: five akenes about 1 to 1.5 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and occurring mostly along the borders of woodland habitats. *DISTRIBUTION*: western North America, from British Columbia to southern California and Texas. ⊛May-July.

HORKELIA.

Nineteen species of western North American herbaceous perennial herbs. All of the species occur in California, and 16 are endemic to the California Floristic Province.

Horkelia yadonii Ertter (segregated from *H. rhydbergii* Elmer [*H. bolanderi* Gray subsp. *parryi* (Watson) Keck]). SANTA LUCIA HORKELIA, VERN YADON'S HORKELIA (p. 159). *HABIT*: tufted perennial herbs with decumbent and ascending stems ranging from about 1 to 6 dm. (4-24") long. As the plants often occur in close proximity, they can form mats covering many square feet. *LEAVES*: gray-green, mostly basal but also cauline (these are alternate and generally reduced in length), about 6 to 20 cm. long, and pinnately divided into 7 to 16 pairs of wedge-shaped to roundish leaflets about 4 to 15 mm. long. The outer margins of the leaflets are toothed to deeply lobed. *INFLORESCENCE*: terminal racemes generally of 5 to 10 flowers. *COROLLA*: five yellowish-white and oblanceolate to elliptic petals about 3 to 5 mm. long. *FRUIT*: two or more akenes about 1.5 mm. long. *OCCURRENCE*: locally common along streams in Pine Valley immediately north of Pine Valley Camp, but not known to occur elsewhere in the Tassajara region. *DISTRIBUTION*: an uncommon plant mostly of the Santa Lucia Mts. (Monterey and San Luis Obispo Counties), but also in the mountains of Santa Barbara Co. *NOTE*: citations in botanical literature for the presence of this species at Tassajara Hot Springs (Howitt & Howell '64, Keck '38) are based on one of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June, 1901 (Elmer #3328 DS). Although Elmer's specimen was on loan at the time I reviewed the specimens at the Dudley and California Academy of Sciences Herbaria in San Francisco, he probably collected it Pine Valley, for he extensively "botanized" the area, and the plants are locally common and very conspicuous. ⊛May-June.

POTENTILLA. CINQUEFOIL.

About 200 to 500 species of northern temperate regions.

Potentilla glandulosa Lindley. STICKY CINQUEFOIL (p. 159). *HABIT*: perennial herbs from a woody caudex, with one to several erect or ascending stems ranging from about 3 to 8 dm. (12-32") tall. *LEAVES*: the basal and lower cauline leaves are up to 25 cm. long, generally oblanceolate in outline, and pinnately divided into three or four pairs of lateral leaflets plus a larger terminal leaflet, the leaflets about 1 to 4 cm. long, obovate to roundish, and with coarsely toothed margins. The upper-most leaves are reduced, short-petiolate to sessile, and divided into three to five generally lanceolate to elliptic leaflets. *INFLORESCENCE*: the flowers are produced in few to many-flowered terminal cymes. *COROLLA*: five pale-yellow to creamy-white petals about 4 to 7 mm. long. *FRUIT*: numerous akenes about 1 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and found mostly on shady woodland slopes or in moist or seasonally moist habitats. *DISTRIBUTION*: Pacific Slope, from Idaho and British Columbia southward, through the Coast Ranges, Sierra Nevada and mountains of southern California and northern Baja California. ⊛May-July.

PRUNUS. STONE-FRUITS.

About 400 species of the northern temperate regions of North America, Eurasia and northern Africa. The genus is the source of many common fruits, such as the various forms of plums, prunes, cherries, apricots, peaches, the horticulturally derived nectarine, and also the nuts of almond trees.

1a. Plants evergreen. Leaves roundish to ovate, the margins sharply-toothed. . . . . ***P. ilicifolia.***
1b. Plants deciduous. Leaves oblong to oblanceolate, the margins finely-serrate:
2a. Leaves mostly oblanceolate and decidedly acute at the apex. Flowers 12 or more in elongated racemes. Fruits deep red. . ***P. virginiana.***
2b. Leaves mostly oblong-obovate and roundish to slightly acute at the apex. Flowers 3 to 10 in short corymbs. Fruits bright red. . . . . ***P. emarginata.***

Prunus emarginata (Douglas) Walpers. BITTER CHERRY (p. 159). *HABIT*: deciduous shrubs or small trees ranging from about 1 to 6 m. (3.3-20') tall. *LEAVES*: short-petiolate and produced mostly in small groups on short lateral stems, the blades oblong-obovate to elliptic with finely serrate margins, and about 2 to 5 cm. long. *INFLORESCENCE*: the flowers are produced in short 3 to 10 flowered lateral racemes. *COROLLA*: five white petals about 4 to 8 mm. long. *FRUIT*: bright red, bitter-sweet, and ovoid to roundish drupes about 7 to 14 mm. long, containing one ellipsoid stone-like seed. *OCCURRENCE*: apparently widely scattered in the Tassajara region, but rare. A few plants were found along Waterfall Creek, above the falls, and perhaps one more in The Pines (the plant had neither flowers or

Cercocarpus betuloides

Fragaria vesca

Holodiscus discolor

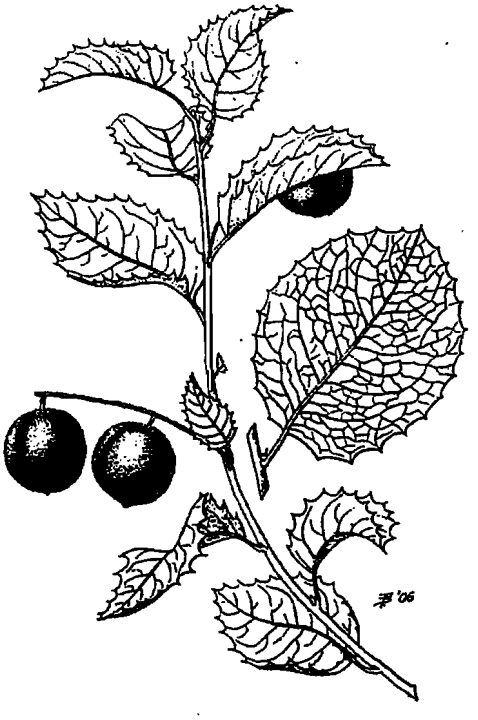
Heteromeles arbutifolia

Horkelia yadonii

Potentilla glandulosa

Prunus emarginata

Prunus virginiana



Prunus ilicifolia

fruits, but the habit and leaf shape suggested this species). Vern Yadon ('80c) reported this species to be present at the Tassajara Canyon overlook along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, and Griffin ('75) reported it to be rare on Pine Ridge. *Distribution*: from British Columbia and Wyoming to California. In California the species ranges through the Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, as far south as San Diego Co. *Note*: the listing of "Tassajara Springs" as a site for this species by Howitt and Howell ('64) was based on a specimen collected by Junea Kelly in July of 1916 (CAS). ⊛April-May.

Prunus ilicifolia (Nuttall) Walpers. ISLAY, HOLLY-LEAFED CHERRY (p. 159). *Habit*: evergreen shrubs or small trees tending to develop rounded crowns ranging from about 2 to 8 m. (6.5 to 26') tall. *Leaves*: alternate, the petioles about 4 to 10 mm. long, the blades dark-green and shiny, roundish to ovate with sharply toothed margins, and about 2 to 5 cm. long. *Inflorescence*: the flowers are produced in few to many-flowered axillary racemes about 3 to 6 cm. long. *Corolla*: five white petals about 2 to 3 mm. long. *Fruit*: ovoid to spherical drupes about 12 to 18 mm. wide. The red skinned drupes have a thin but sweet pulp and a large stone-like seed. *Occurrence*: widely scattered in chaparral or in transitional areas at lower to intermediate elevations of the Tassajara region, and although generally uncommon, plants become rather plentiful towards the Arroyo Seco River. *Distribution*: Coast, Transverse and Peninsular Ranges, from Napa County to northern Baja California. ⊛ April-May.

Prunus virginiana Linnaeus var. **demissa** (Nuttall) Sargent [*P. d.* (Nuttall) Walpers]. WESTERN CHOKE CHERRY (p. 159). *Habit*: deciduous shrubs or small trees ranging from about 1 to 6 m. (3-20') tall. *Leaves*: alternate, the petioles about 10 to 25 mm. long, the blades about 5 to 10 cm. long, oblong-obovate to oblong-ovate with an abruptly tapered apex, and with finely serrate margins. *Inflorescence*: the flowers are numerous in lateral racemes about 5 to 10 cm. long. *Corolla*: five white petals about 4 to 7 mm. long. *Fruit*: dark-red, bitter-sweet, and ovoid to spheric drupes about 6 to 14 mm. long, containing a roundish to slightly ellipsoid stone-like seed. *Occurrence*: fairly common along the fire-break trail between Tassajara Road and the Pine Ridge Trail (at the first summit west of China Camp), and scattered in Pine Valley and in Strawberry Valley. Although this species was not seen elsewhere in this region, it probably occurs in other areas. *Distribution*: widely distributed in western North America, from British Columbia to northern Mexico. ⊛May-June.

ROSA. ROSE.

About 100 species primarily of northern temperate regions.

Rosa californica Chamisso & Schlechtendal. CALIFORNIA ROSE (p. 163). *Habit*: evergreen shrubs or subshrubs with relatively slender and thorny branches ranging from about 1 to 3 m. (3.3-10') long. *Leaves*: alternate and petiolate, about 4 to 8 cm. long, and pinnately divided into five to seven oval to oblong-ovate, serrately margined leaflets about 1 to 3.5 cm. long. *Inflorescence*: the aromatic flowers are produced in few to many-flowered terminal corymbs. *Corolla*: five rose-pink petals about 1 to 2 cm. long. *Fruit*: the akenes are produced in an enlarged globose to ovoid floral tube (rose-hip) about 8 to 20 mm. wide, which becomes fleshy and sweet when mature. *Occurrence*: scattered in wet or seasonally wet habitats in the Tassajara region, but generally uncommon, except in some areas, such as Pine Valley and Strawberry Valley. Near the hot springs a few plants are established in the old streambed depression in The Flats, and thickets occur in marshy areas along Waterfall Creek above the series of falls. *Distribution*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊛May-Aug.

RUBUS. BLACKBERRY, RASPBERRY.

A widely distributed genus of about 200 to 700 species that are especially well represented in northern temperate regions and the mountains of South America.

1a. Plants with erect and thornless branches. Leaves deciduous, not divided into leaflets, more or less roundish in outline, and palmately five-lobed. . . . . ***R. parviflorus***.
1b. Plants with sprawling and thorny branches. Leaves evergreen and mostly divided into 3 to 5 leaflets:
2a. Primary stems roundish and with slender thorns. The majority of the leaves divided into 3 leaflets. . . . . ***R. ursinus***.
2b. Primary stems five-angled and with stout thorns. The majority of the leaves divided into 5 leaflets. . . . . ***R. discolor***.

***Rubus discolor** Weihe & Nees [*R. procerus* Mueller]. HIMALAYAN BLACKBERRY (p. 163). *Habit*: robust subshrubs with numerous long and sprawling branches typically forming mound-like thickets that can cover large areas. *Leaves*: the leaves of the primary stems are divided into five roundish-ovate to obovate and serrately-margined leaflets up to 12 cm. long, while the outer leaves of the lateral flowering stems are typically smaller and often three-foliate. *Inflorescence*: the flowers are produced in terminal panicles. *Corolla*: five white or sometimes pinkish obovate petals about 10 to 15 mm. long. *Fruit*: a hemispheric to roundish-oblong aggregation of drupelets (blackberries) up to 2 cm. long; the fruits become purplish-black in maturity. *Occurrence*: common along Tassajara Creek in the vicinity of Tassajara Hot Springs, and scattered for several miles downstream. *Distribution*: a frequent weed around developed areas in California; native to Eurasia. *Note*: this species was probably introduced at Tassajara for its fruits, which are produced in abundance from mid-summer until the first frosts of winter. ⊛May-Oct.

Rubus parviflorus Nuttall [*R. p.* var. *velutinus* (Hooker & Arnott) Greene]. THIMBLE-BERRY (p. 163). *Habit*: semi-shrubby plants with erect and thornless stems ranging from about 1 to 2 m. (3.3-6.6') tall. *Leaves*: alternate and deciduous, the petioles about 2 to 12 cm. long, the blades roundish to deltoid in outline, palmately five-lobed with irregularly serrate margins, and about 10 to 15+ cm. wide. *Inflorescence*: the showy flowers are one to several in terminal corymbs or cymes. *Corolla*: five elliptic-obovate and white or sometimes pinkish-tinged petals about 15 to 30 mm. long. *Fruit*: a hemispheric and raspberry-like aggregation of drupelets about 1 to 1.5 cm. wide; the fruits become red or orangish-red in maturity. *Occurrence*: widely scattered and locally common in moist and shady riparian habitats in the Tassajara region, such as along Church Creek, upper Tassajara Creek, Oryoki Creek, and along Willow Creek (where it is quite abundant). *Distribution*: from Alaska to eastern Canada, and southward, through the Rocky Mts. and the mountains of the Pacific Slope, to New Mexico and southern California (to San Diego Co.) ⊛March-Aug.

Rubus ursinus Chamisso & Schlechtendal [*R. vitifolius* (C. & S.) subsp. *u.* (C. & S.) Abrams]. CALIFORNIA BLACKBERRY (p. 163). *Habit*: evergreen subshrubs with sprawling and thorny stems up to 5.5 m. (18') long. *Leaves*: the leaves of the primary stems are divided into three (or rarely five) ovate to lance-ovate leaflets with doubly serrate mar-

gins, with the terminal leaflet larger (up to 12 cm. long) and often three-lobed, while the outer leaves of the lateral flowering stems are typically smaller and cleft into three lobes. *Inflorescence*: the flowers are produced in cyme-like terminal clusters. *Corolla*: five white petals, those of staminate flowers are narrow and up to 15 mm. long, while those of perfect or pistillate flowers are shorter and broader. *Fruit*: a narrowly oblong to narrowly conical aggregation of drupelets (blackberries) about 1 to 2 cm. long, which become purplish-black in maturity. *Occurrence*: widespread and common along perennial and seasonal streams in the Tassajara region, and sometimes in other generally moist and/or shady habitats, such as on woodland slopes or where the watertable is near the surface. *Distribution*: British Columbia and Idaho to northern Baja California. *Note*: although the fruits are rather small and not produced in quantity, the flavor is excellent. Boysenberries, Loganberries, and other commercial blackberry strains are derivatives of this species. ⊛March-July.

Notes on *Rosaceae*:

According to Griffin ('75), ***Oemleria cerasiformis*** (*Osmaronia c.*, Oso Berry), is uncommon below 1200 m. (3900') and rare above 1200 m. on Chew's Ridge. Weedy about the gardens of Tassajara Hot Springs, and occasionally in the Flats, is ***Sanguisorba minor***, Salad Burnet.

RUBIACEAE. MADDER FAMILY.

A primarily tropical family of about 500 genera and 6,000 species of trees, shrubs and herbs. The family includes *Coffea* (coffee trees), *Cinchona* (from which quinine is derived), and many ornamentals, such as those of the genera *Gardenia*, *Pentas*, *Houstonia*, *Bouvardia* and *Hedyotis*.

GALIUM. BEDSTRAW, CLEAVERS.

A widely distributed but primarily temperate genus comprised of about 400 species.

1a. Annual herbs with weak and trailing stems. Leaves 6 to 8 per whorl. Fruits bristly. . . . . ***G. aparine***.
1b. Evergreen perennial herbs or subshrubs with erect, spreading or climbing stems. Leaves 4 per whorl. Fruits bristly to nearly glabrous:
2a. Fruits densely bristly. Broom-like subshrubs with numerous erect or ascending stems. . . . . ***G. angustifolium***.
2b. Fruits glabrous to sparsely hairy. Plants with trailing or climbing stems, or forming low mats via a system of creeping rhizomes:
3a. Sprawling or climbing vine-like subshrubs. Stems and leaves glabrous or nearly so:
4a. Leaves ovate to broadly oblong. . . . . ***G. porrigens porrigens***.
4b. Leaves narrowly linear to linear-oblong. . . . . ***G. porrigens tenue***.
3b. Tufted, trailing or matted plants. Stems and leaves variously pubescent:
5a. Leaves appearing to be linear due to strongly revolute margins. Rare on granitic outcrops above 4,000 ft. . . . . ***G. clementis***.
5b. Leaves flat or only slightly revolute. Widespread and locally common in this region:
6a. Herbage with coarse and more or less sparse hairs. . . . . ***G. californicum californicum***.
6b. Herbage with soft and fine and more or less dense hairs, or sometimes nearly glabrous. . . . . ***G. californicum flaccidum***.

⇧**Galium angustifolium** Nuttall. CHAPARRAL BEDSTRAW (p. 163). *Habit*: broom-like evergreen subshrubs with numerous slender, semi-woody, and erect or ascending stems ranging from about 3 to 12 dm. (1-4') tall. *Leaves*: produced in whorls of four and sessile or nearly so, the blades narrowly linear to lance-linear, and about .5 to 2 cm. long. *Inflorescence*: the flowers are small and produced in the cymose clusters of an often elongated panicle. *Corolla*: four-lobed, yellowish, and about 1.5 to 2.5 mm. wide. *Fruit*: two-lobed, densely bristly, and about 1 to 2 mm. in diameter. *Occurrence*: widely scattered and locally common in chaparral in the Tassajara region, particularly on highly exposed southfacing slopes that are dominated by subshrubs. *Distribution*: Coast Ranges, southern Sierra Nevada Foothills, western Transverse Ranges, and western Peninsular Ranges and coastal southern California, from Monterey and Kern Counties to northern Baja California. ⊛April-June.

Galium aparine Linnaeus. GOOSE-GRASS, CLEAVERS (p. 163). *Habit*: annual herbs with weak and trailing stems ranging from about 1 to 10 dm. (4-40") long. The stems are equipped with minute, backwardly curved hooks on the angles, which enable plants to climb on other plants (or to cling to fur or clothing). *Leaves*: borne in whorls of six to eight at the nodes, mostly linear-oblanceolate to oblanceolate, and about 1 to 7 cm. long. *Inflorescence*: axillary cymes of two to five small flowers. *Corolla*: rotate, four lobed, greenish-white, and about 2 mm. wide. *Fruit*: two roundish and densely bristly nutlets about 3 to 5 mm. in diameter. *Occurrence*: scattered and locally common in shady habitats in the Tassajara region. *Distribution*: widespread in temperate North America and Eurasia. *Note*: although many authors believe that this species is native only to Eurasia, it was widely distributed and behaving as a native element of the North American flora by the time serious botanical work had commenced on this continent. ⊛March-May.

⇩**Galium californicum** Hooker & Arnott. CALIFORNIA BEDSTRAW (p. 163). *Habit*: highly variable evergreen perennial herbs with tufted or trailing (or sometimes climbing) and often semi-woody stems ranging from about .5 to 3 dm. (2-12") long. *Leaves*: produced in whorls of four, sessile to very short-petiolate, the blades ovate to narrowly or broadly oblong or elliptical, and ranging from about 3 to 12 mm. long. *Inflorescence*: staminate flowers are produced in few-flowered terminal and axillary clusters, while pistillate flowers are usually solitary in the axils of the upper leaves. *Corolla*: four-lobed, rotate, pale yellow or greenish, and about 2 to 4 mm. wide. *Fruit*: dark, fleshy, two-lobed, softly hairy to glabrous, and about 1 to 3 mm. wide. *Occurrence*: widely scattered and locally common in the Tassajara region, particularly in shady or semi-shady woodland habitats, but mostly at higher to intermediate elevations. *Distribution*: Coast Ranges, from Humboldt and Siskiyou Counties to the Santa Lucia Mts. of Monterey Co. *Notes*: the plants of this region are highly variable, and although many "key-out" to subsp. *californicum*, many are not clearly discernible from subsp. *flaccidum*, and many others exhibit traits that are not assignable to either taxon. This situation is apparently to be expected in this region, for the plants of the Santa Lucia Mts. of Monterey Co. are noted for their taxonomically problematic characteristics (Dempster & Stebbins '68, Dempster '79). Four hybridizing subspecies are present in the northern Santa Lucia Mts., and adding to this situation is the probable genetic interchange between the *G. californ-*

icum complex and *G. porrigens* and *G. clementis*. Some of the plants of this region, with thickish leaves less than 6 mm. long, approach the description of *G. c.* subsp. *luciense* Dempster & Stebbins (a rare endemic of the Santa Lucia Mts. of Monterey Co.), but the leaves of such plants are scarcely if at all petiolate, an thus may represent intermediates between subsp. *luciense* and subsp. *flaccidum*. ⊛March-July.

⇧**Galium californicum** subsp. **flaccidum** (Greene) Dempster & Stebbins (p. 163). *HABIT*: like that of the typical species, but with softer and finer hairs on the leaves and stems. The local plants are often not clearly distinguishable from the typical species. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, mostly in shady to semi-open areas, especially in woodlands. *DISTRIBUTION*: Santa Lucia Mts. of Monterey and San Luis Obispo Counties, Santa Ynez Mts. of Santa Barbara Co., and the San Gabriel Mts. of Los Angeles and southwestern San Bernardino Counties. Also on Santa Cruz Island. ⊛March-July.

○**Galium clementis** Eastwood. SANTA LUCIA BEDSTRAW (p. 163). *HABIT*: tufted and densely leafy evergreen perennial herbs with numerous slender and erect stems ranging from about 8 to 13 cm. (3-5") tall, which arise from a system of slender rhizomes. *LEAVES*: produced in whorls of four (or rarely six), narrowly ovate-lanceolate to elliptic-oblong (but appear to be linear due to strongly revolute margins), finely hispid-pubescent, and about 2 to 7 mm. long. *INFLORESCENCE*: the flowers are very small and produced singularly or in small cymes in the axils of the upper leaves. *COROLLA*: four lobed, pale-yellow, and about 1 mm. wide. *FRUIT*: two-lobed, fleshy, and about 1 to 2 mm. wide. *OCCURRENCE*: known from only two sites in the Tassajara region, both of which were first discovered by Vern Yadon in 1979 (Yadon '79 a & b). One site is amongst granitic rock outcrops and boulders along the crest of Black Butte, about .75 to 1 mile south-southeast of Tassajara Road (at the point where the road first reaches the summit if one is coming from the hot springs). The other site is amongst granitic outcrops on the summit of Yadon's "Never-Again Ridge," which separates the watersheds of upper Tassajara Creek and Church Creek. *DISTRIBUTION*: a rare species that is restricted to the higher elevations of the Santa Lucia Mountains of Monterey County. Besides for the two locations listed above, the only other documented sites that I am aware of are on the Ventana Double Cone, Junipero Serra Peak, Cone Peak, Bear Mt. (Yadon CAS), and at about 3,000 ft. along the Cruikshank Trail (Howitt #1728 CAS). *NOTE*: the type specimen, which was collected by (and named for) Mary Strong Clemens on Junipero Serra Peak in October of 1921, was one of a series of specimens collected by Clemens in the Santa Lucia Mts. in early October of 1921; the stated locality of at least five of these specimens is "Tassajara Springs, Monterey Co." ⊛June-July.

Galium porrigens Dempster [*G. ruttallii* Gray subsp. *ovalifolium* (Dempster) Dempster & Stebbins]. CLIMBING BEDSTRAW (p. 163). *HABIT*: evergreen subshrubs with slender, semi-woody, and climbing or trailing stems ranging up to 20+ dm. (6.5+') long. The typically remote branches are often profusely divided into branchlets. *LEAVES*: produced in whorls of four, sessile or nearly so, the blades broadly oval to oblong, often with revolute margins, and about 4 to 15 mm. long. *INFLORESCENCE*: the pistillate flowers are produced singularly or in small groups at the ends of the branchlets, while the staminate flowers are produced in axillary cymes. *COROLLA*: four-lobed, yellowish-white, and about 1 mm. wide. *FRUIT*: moist and berry-like, two-lobed, about 4 to 6 mm. wide, and becoming wrinkled and nearly black when dry. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, and occurring mostly in chaparral or in transitional areas. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊛March-June.

Galium porrigens var. **tenue** (Dempster) Dempster [*G. ruttallii* subsp. *tenue* (Demps-ter) Dempster & Stebbins] (p. 163). *HABIT*: similar to the typical species, except for the narrowly linear or linear-oblong leaves. *OCCURRENCE*: widely scattered in the Tassajara region, mostly in chaparral. *DISTRIBUTION*: Coast Ranges, mostly towards the interior, from Lake Co. to San Luis Obispo Co., and the Sierra Nevada Foothills, from Shasta Co. to Kern Co. ⊛March-June.

SALICACEAE. WILLOW FAMILY.

Two genera of primarily northern-temperate trees and shrubs; most of the species are restricted to riparian habitats.

1a. Leaves ovate to deltate or reniform, and about as long as wide to no more than twice as long as wide. Catkin scales divided into narrow segments. Staminate flowers with many stamens and surrounded by a cup-like disk. Buds with many scales. . . . . ***Populus***.
1b. Leaves narrowly linear to lanceolate or oblanceolate, and at least three times longer than wide. Catkin scales entire. Staminate flowers with 1 or 2 stamens and not surrounded by a cup-like disk. Buds with a single scale. . . . . ***Salix***.

POPULUS. POPLAR, ASPEN, COTTONWOOD.

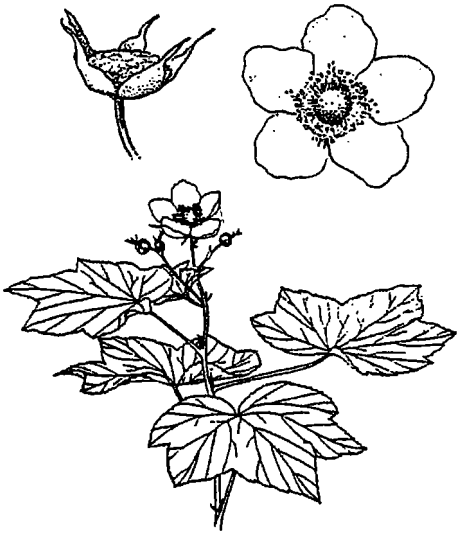
About 40 species of northern hemispheric trees.

1a. Leaves broadly to narrowly ovate, longer than wide, and with finely serrate or crenate margins. . . . . ***P. balsamifera***.
1b. Leaves broadly deltate, about as long as wide, and with coarsely crenate to serrate or irregularly lobed margins. . . . . ***P. fremontii***.

Populus balsamifera Linnaeus subsp. **trichocarpa** (Torrey & Gray) Brayshaw [*P. t.* T. & G.]. BLACK COTTONWOOD (p. 165). *HABIT*: deciduous trees up to 30+ m. (98+') tall, with fully mature trees typically free of branches for more than half the height, then branching into broadly rounded crowns. *BARK*: grayish and fissured into narrowly elongated plates. *LEAVES*: alternate, the petioles about 1 to 3.5 cm. long, the blades about 3 to 7 cm. long, broadly to narrowly ovate, rounded to cordate at the base and acute to acuminate at the apex, and with finely serrate or crenate margins. *INFLORESCENCE*: staminate or pistillate catkins about 4 to 8 cm. long. *FRUIT*: a subglobose capsule about 4 mm. wide. *OCCURRENCE*: rare in the Tassajara region, for only a few and remotely scattered trees were found along Tassajara Creek between the confluences of Oryoki and Church Creeks. *DISTRIBUTION*: Pacific Slope, from Alaska to northern Baja California, and eastward to the northern Rocky Mountains, with scattered populations in the Great Basin and the northern Great Plains. ⊛Feb.-April.

Rosa californica

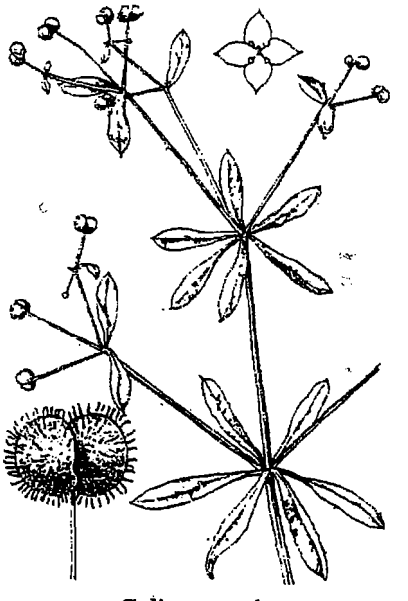
Rubus discolor



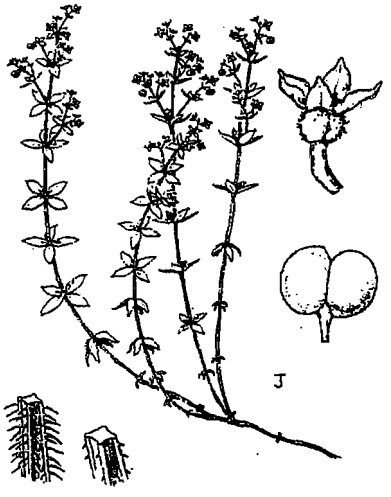
Rubus parviflorus

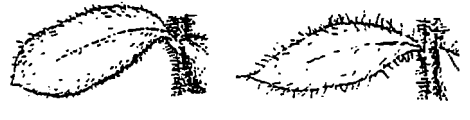
Rubus ursinus

Galium angustifolium



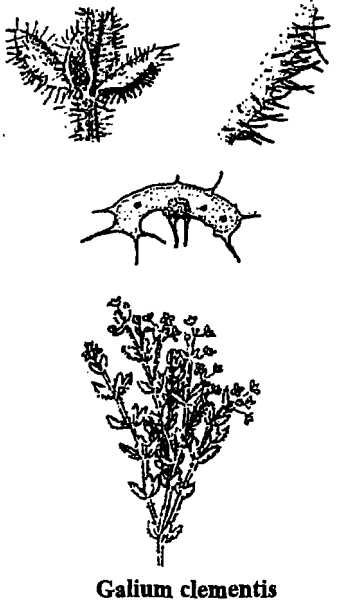
Galium aparine





ssp. flaccidum ssp. californicum

Galium californicum



Galium clementis

var. tenue

Galium porrigens

Populus fremontii Watson. FREMONT COTTONWOOD (P. 165). *HABIT*: deciduous trees ranging from about 12 to 30 m. (40-98') tall when mature. *BARK*: roughly cracked into more or less squarish or rectangular checks, the outer surfaces typically with a whitish cast. *LEAVES*: alternate and with petioles about 2 to 6 cm. long, the blades about 3 to 7 cm. long, broadly deltate with a subcordate to truncate base and an abruptly acute apex, and with crenately to serrately and often irregularly lobed margins. *INFLORESCENCE*: staminate or pistillate catkins about 4 to 5 cm. long. *FRUIT*: an ovate to roundish capsule about 8 to 12 mm. long. *OCCURRENCE*: scattered along perennial streams and occasionally at springs or seeps at lower to intermediate elevations of the Tassajara region, but generally uncommon. Small groves also occur along some of the intermittent streams of this region, but such trees tend to be depauperate. *DISTRIBUTION*: widespread in riparian habitats in California, from Siskiyou Co. to northern Baja California, and eastward to southern Utah, western Texas, and northern Mexico. ⊛March-April.

SALIX. WILLOW.

A widely distributed but primarily northern temperate and boreal genus comprised of anywhere from between 350 to 500 species. The large variance is due to the taxonomically problematic nature of many of the taxa.

1a. Bark smooth. Leaves mostly oblanceolate and obtuse or broadly acute at the apex. . . . . ***S. lasiolepis***.
1b. Bark rough. Leaves narrowly linear to lanceolate (or sometimes narrowly oblanceolate), and narrowly acute at the apex:
2a. Leaves lanceolate to oblong-lanceolate, about 1.5 to 3 cm. wide, and with finely serrate margins. . . . . ***S. laevigata***.
2b. Leaves narrowly linear to narrowly elliptic or oblanceolate, usually less than 1 cm. wide, and with remotely toothed or entire margins:
3a. Stigma lobes about 1 mm. long, the style about .5 mm. long. Upper and lower leaf surfaces nearly the same shade. . . . . ***S. exigua***.
3b. Stigma lobes less than 1 mm. long, the stigma sessile. Upper leaf surface dark green, the lower surface pale. . . . . ***S. melanopsis***.

Salix exigua Nuttall [*S. hindsiana* Bentham, *S. sessilifolia* Nuttall var. *hindsiana* Andersson]. SANDBAR WILLOW, NARROW-LEAF WILLOW, VALLEY WILLOW (P. 166). *HABIT*: large deciduous shrubs or sometimes small trees ranging from about 3 to 7 m. (10-23') tall. *BARK*: gray and furrowed. *LEAVES*: alternate and short-petiolate, the blades about 4 to 8 cm. long, linear to lance-linear, tapering to the base and acute at the apex, and with entire or remotely toothed margins. *INFLORESCENCE*: staminate or pistillate catkins about 2 to 7 cm. long. *FRUIT*: a many seeded capsule about 5 to 6 mm. long. *OCCURRENCE*: widely scattered and locally common along perennial streams in the Tassajara region, and sometimes on floodplains. *DISTRIBUTION*: widespread in North America, from Alaska to the Atlantic Coast and Mexico. ⊛ March-May.

Salix lasiolepis Bentham. ARROYO WILLOW, WHITE WILLOW (P. 166). *HABIT*: large deciduous shrubs or sometimes small trees usually less than 6 m. (20') tall. *BARK*: smooth and light-colored. *LEAVES*: alternate and short-petiolate, the blades about 3 to 12 cm. long, oblanceolate to lanceolate-elliptic, obtuse to acute at the apex and narrowed at the base. *INFLORESCENCE*: staminate or pistillate catkins about 1.5 to 7 cm. long. *FRUIT*: a capsule about 4 to 5 cm. long. *OCCURRENCE*: widely scattered and locally common along perennial or mostly perennial streams in the Tassajara region, particularly along smaller streams. *DISTRIBUTION*: western North America, from Washington and Idaho to Mexico and Texas. ⊛March-April.

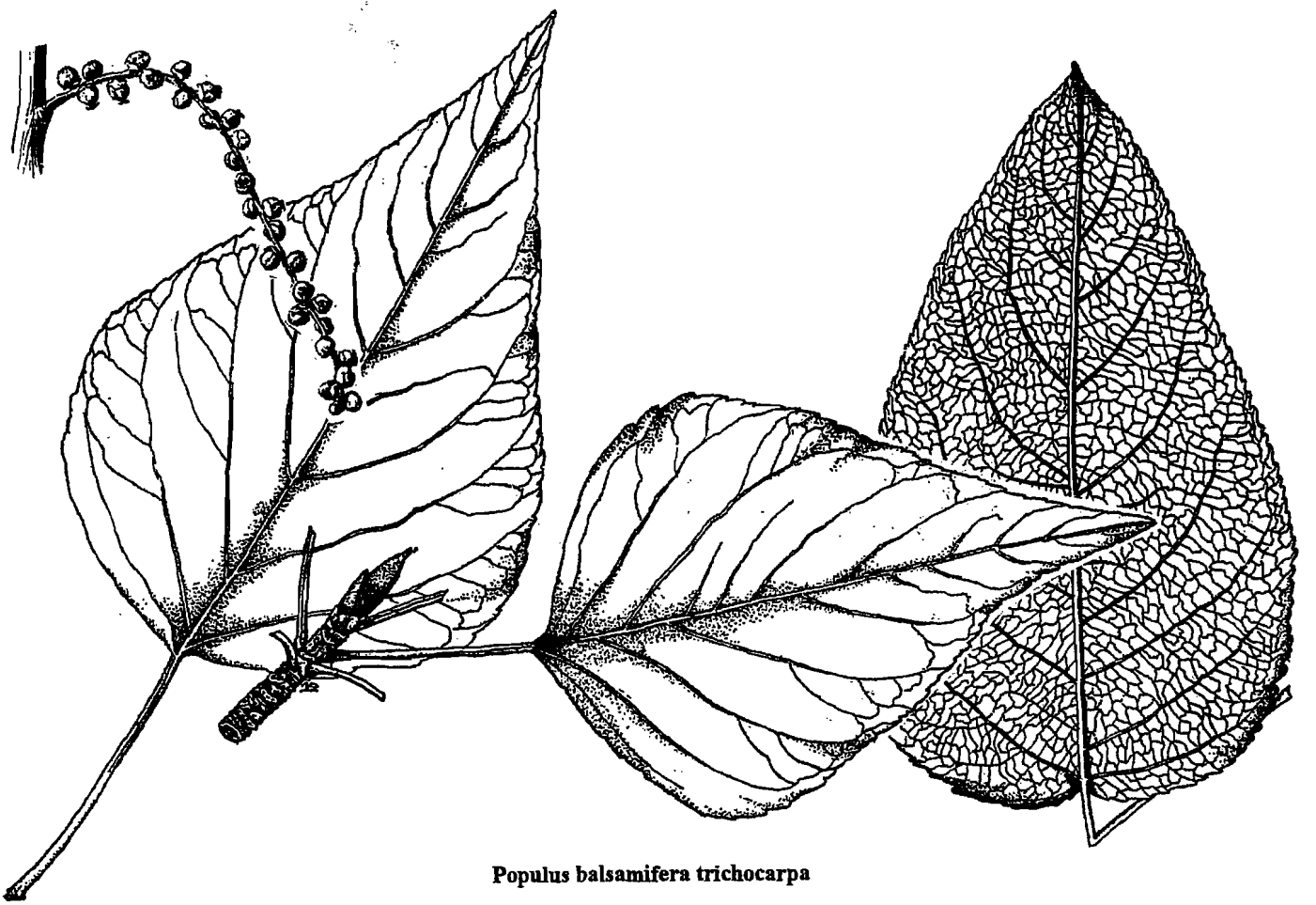
Salix laevigata Bebb. RED WILLOW, POLISHED WILLOW (P. 166). *HABIT*: deciduous trees ranging from about 5 to 15 m. (16-50') tall. *BARK*: dark and roughly textured. *LEAVES*: alternate and short-petiolate, the blades about 5 to 15 cm. long, lanceolate to oblong-lanceolate, green above and pale below, with finely serrate margins. *INFLORESCENCE*: staminate or pistillate catkins about 3 to 11 cm. long. *FRUIT*: an ovoid capsule about 3.5 to 5 mm. long. *OCCURRENCE*: widespread and locally common to abundant along perennial streams of the Tassajara region. *DISTRIBUTION*: western North America, from southern Oregon and Utah to northern Central America. *NOTE*: although this is the only willow species in this region that attains truly tree-sized proportions, fully mature plants are generally uncommon region, and occur mostly at sites that are protected from the swift torrents that follow major storms (the torrents sweep away a high percentage of young trees). ⊛April-May.

⇕**Salix melanopsis** Nuttall [*S. m.* var. *bolanderiana* (Rowlee) Schneider]. DUSKY WILLOW, LONG-LEAFED WILLOW (P. 166). *HABIT*: large deciduous shrubs or small trees ranging from about 3 to 5 m. (10 to 17') tall. *LEAVES*: alternate and short-petiolate, the blades about 3 to 8 cm. long, narrowly oblanceolate to elliptic, acute at both ends, and with remotely toothed margins. *INFLORESCENCE*: staminate or pistillate catkins about 2 to 5 cm. long. *FRUIT*: a many-seeded capsule about 4 to 5 mm. long. *OCCURRENCE*: scattered along Tassajara Creek in the vicinity of Tassajara Hot Springs, and perhaps in other areas of the Tassajara region. *DISTRIBUTION*: from British Columbia to Colorado and California. In California the species extends southward through the Sierra Nevada, and southward in the Coast Ranges to Lake and Sonoma Counties. Disjunct populations occur in the Santa Lucia Mountains and Transverse Ranges (San Gabriel and San Bernardino Mts.). *NOTES*: *S. melanopsis* strongly resembles *S. exigua*, and it is difficult to distinguish the two if pistillate flowers are not present. I was first made aware of the presence of this taxon at Tassajara by Diane Renshaw and Flip Dibner. This species has been previously collected at Tassajara Hot Springs by William Dudley (DS, "Tassajara Springs, June 11, 1901"), A. D. E. Elmer (#3345 DS, "near camp at Springs, June 1901"), and Junea Kelley (CAS, "Tassajara Springs, June 1917"). ⊛March-May.

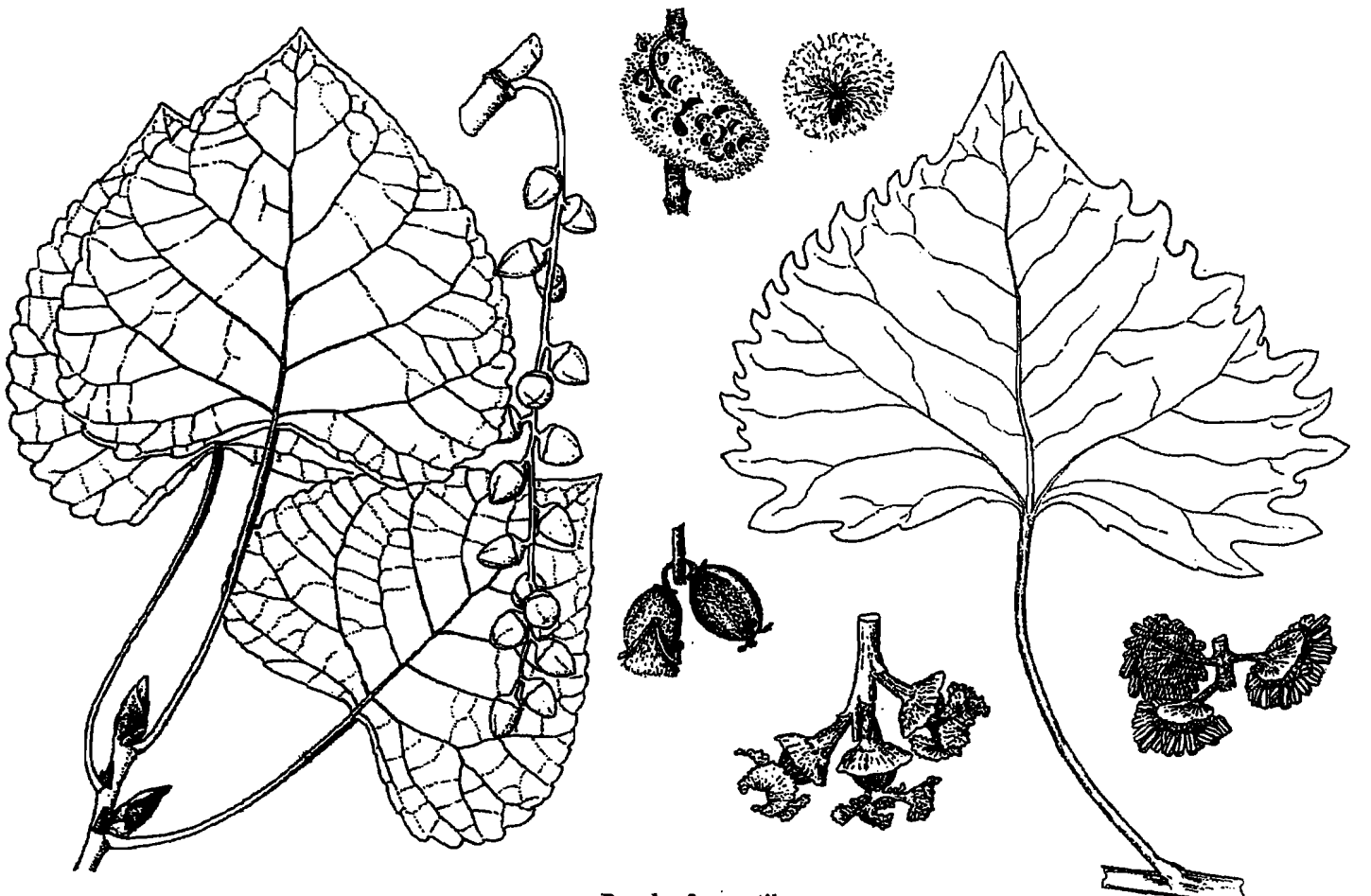
SAXIFRAGACEAE. SAXIFRAGE FAMILY.

About 40 genera and 680 species primarily of boreal and temperate regions of the Northern Hemisphere. The family is closely related to and is often considered to be inclusive of *Grossulariaceae* (Gooseberry or Currant Family), *Philadelphaceae* (Mock-Orange Family) and *Hydrangeaceae* (Hydrangea Family).

1a. Plants generally of shady or partly shady woodland habitats, and dying back to the root during the dry season. Fertile (pollen-producing) stamens 10 per flower:
2a. Leaves primarily but not strictly basal. Petals mostly three-lobed at the apex. Styles 3. . . . . ***Lithophragma***.
2b. Leaves strictly basal. Petals entire. Styles 2. . . . . ***Saxifraga***.
1b. Plants of wet habitats and remaining green throughout the dry season. Fertile stamens 5 per flower:
3a. Flowers produced singularly on slender scapes. Petals 10 to 18 mm. long. . . . . ***Parnassia***.



Populus balsamifera trichocarpa



Populus fremontii

Salix laevigata

Salix exigua

Salix lasiolepis

Salix melanopsis

3b. Flowers produced in panicles. Petals 2 to 4 mm. long:
4a. Leaves basal and cauline, the blades generally round to reniform in outline. Ovaries 2-celled, the placenta connected to the center. . . . ***Boykinia.***
4b. Leaves strictly basal, the blades generally ovate in outline. Ovaries 1-celled, the placenta connected to the sides. . . . . ***Heuchera.***

BOYKINIA.

Eight species of North America and eastern Asia.

Boykinia occidentalis Torrey & Gray [*B. elata* (Nuttall) Greene]. BROOK FOAM (P. 169). *HABIT*: perennial herbs with one to several erect or ascending stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: alternate, the lower larger and with petioles about 5 to 30 cm. long, the blades reniform to ovate-cordate in outline, about 2 to 8 cm. wide, and divided into five to seven primary lobes which are further lobed and/or toothed. The cauline leaves are similar, but reduced and on shorter petioles, while the upper-most are sessile and bract-like. *INFLORESCENCE*: the flowers are produced mainly on the upward side of the branches of an open panicle. *COROLLA*: five white and generally obovate petals about 3 to 4 mm. long. *FRUIT*: a two-celled and many-seeded capsule about 3 to 5 mm. long. *OCCURRENCE*: widely scattered along perennial streams in the Tassajara region, particularly in areas where streams have cut deep into the bedrock. *DISTRIBUTION*: Cascades Ranges, Coast Ranges, Sierra Nevada and western Transverse Ranges, from British Columbia to the Santa Monica Mts. of western Los Angeles Co. ⊛June-Aug.

HEUCHERA. ALUM-ROOT.

About 50 species of temperate North America.

⇩**Heuchera micrantha** Douglas ex Lindley [*H. m.* var. *pacifica* Rosendahl, Butters & Lakela] (P. 169). *HABIT*: perennial herbs with several erect or ascending stems ranging from about 3 to 7 dm. (12-28") tall. *LEAVES*: strictly basal, the petioles about 3 to 20+ cm. long, the blades generally ovate-cordate in outline, about 2 to 8 cm. long, and with five to seven deep to shallow and crenately toothed lobes. *INFLORESCENCE*: the small flowers are produced on the very slender branches of an open panicle about 1 to 6 dm. long. *COROLLA*: five white and narrowly oblanceolate petals about 3 to 5 mm. long. *FRUIT*: an ovoid capsule about 4 to 5 mm. long. *OCCURRENCE*: scattered along perennial streams in the Tassajara region, and locally common at major rock outcrops where streams have cut deep into the bedrock. *DISTRIBUTION*: from British Columbia and Idaho to California, extending southward to the Santa Lucia Mts. of northwestern San Luis Obispo Co. in the Coast Ranges, and to Tulare Co. in the Sierra Nevada. ⊛ May-July.

LITHOPHRAGMA. WOODLAND STAR.

Twelve species of western North America. Nine species occur in California, and six are endemic to the California Floristic Province.

1a. Base of calyx abruptly constricting to the pedicel. Pedicels less than 2 mm. long. . . . . ***L. heterophyllum.***
1b. Base of calyx tapering to the pedicel. Pedicels 2 to 8 mm. long. . . . . ***L. affine.***

Lithophragma affine Gray. WOODLAND STAR (P. 169). *HABIT*: delicate perennial herbs with erect stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: generally long petiolate, the basal leaves, which are produced in loose rosettes, have orbicular to reniform blades about 1 to 4 cm. wide which are generally with three to five very shallow lobes; the lobes variously sub-lobed or toothed. The one to three cauline leaves are alternate, reduced, and with blades which are generally ovate in outline and deeply cleft into three primary lobes. *INFLORESCENCE*: a terminal raceme about 5 to 15 cm. long. *COROLLA*: five white and distally three-lobed petals about 5 to 13 mm. long. *FRUIT*: a small and many-seeded capsule about 3 to 4 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and locally common in partly shady and usually grassy woodland habitats. *DISTRIBUTION*: Coast, western Transverse and Peninsular Ranges, from southwestern Oregon to northern Baja California, and the Sierra Nevada Foothills, from Placer Co. to Madera Co. ⊛ March-May.

Lithophragma heterophyllum (Hooker & Arnott) Torrey & Gray. HILL STAR (P. 169). *HABIT*: delicate perennial herbs with slender stems ranging from about 2 to 5 dm. (8-20") tall. *LEAVES*: the basal leaves, which are produced in loose rosettes on petioles up to 8 cm. long, have generally orbicular blades about 1.5 to 4 cm. wide; the margins are shallowly lobed. The cauline leaves are alternate, reduced, and with blades which are often deeply parted into three to five lobes. *INFLORESCENCE*: a three to twelve flowered terminal raceme about 1 to 4 dm. long. *COROLLA*: five white petals about 5 to 12 mm. long, which are usually three lobed or toothed towards the apex (but can be simple or with five or seven lobes or teeth). *FRUIT*: a many-seeded capsule about 3 to 4 mm. long. *OCCURRENCE*: widely scattered in shady woodland habitats in the Tassajara region, and fairly common in some areas. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Humboldt Co. to northern Los Angeles Co. ⊛March-May.

PARNASSIA. GRASS OF PARNASSUS.

Twenty-five to 50 species of temperate and boreal regions of the Northern Hemisphere.

Parnassia californica (Gray) Greene [*P. palustris* Linnaeus var. *c.* Gray]. CALIFORNIA GRASS OF PARNASSUS (P. 169). *HABIT*: perennial herbs with strictly basal leaves and long and slender scapes about 2.5 to 5 dm. (19-20") tall. *LEAVES*: produced in rosettes, the petioles about 2 to 10 cm. long, the blades broadly to narrowly ovate with a cuneate base and entire margins, and about 2.5 to 4 cm. long. *INFLORESCENCE*: the flowers are singular and terminal on the scapes, and usually closely subtended by an ovate bract less than 1 cm. long. *COROLLA*: five round-ovate petals about 8 to 20 mm. long, which are pale white with yellowish or greenish veins. *FRUIT*: a four-valved capsule about 8 to 12 mm. long. *OCCURRENCE*: this entry is based on Jeffrey Norman's report of this species from "near Horsebridge Camp on Arroyo Seco River" in 1970 (Howitt & Howell '73). *DISTRIBUTION*: from southwestern Oregon to San Benito and Monterey Counties in the Coast Ranges, and through the Sierra Nevada (up to 13,000 ft.). According to Munz ('59), it also occurs in the San Bernardino Mountains. ⊛July-Oct.

SAXIFRAGA. SAXIFRAGE.

About 400 species primarily of cooler northern temperate regions.

Saxifraga californica Greene [*S. virginiensis* Michx. var. *c.* Jepson]. CALIFORNIA SAXIFRAGE (P. 169). *HABIT*: small perennial herbs from a short and thick caudex, with erect flowering stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: strictly basal and produced in rosettes, the petioles about .5 to 3 cm. long, the blades ovate to oblong-elliptic with serrate to denticulate margins, and about 1 to 5 cm. long. *INFLORESCENCE*: an open and loosely branched panicle. *COROLLA*: five white and obovate to broadly elliptic petals about 3.5 to 5 mm. long. *FRUIT*: a small and purplish-tinged follicle-like capsule about 2.5 to 3.5 mm. long. *OCCURRENCE*: widely scattered and locally common in shady woodland habitats at lower to intermediate elevations in the Tassajara region. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from southwestern Oregon to northern Baja California. ⊛March-May.

SCROPHULARIACEAE. FIGWORT FAMILY.

A widely distributed family comprised of about 200 genera and roughly 3,000 species of herbs and shrubs. The family is well represented in western North America, especially in California, and about 40% of the species that occur within the state are endemic to California Floristic Province. With at least 25 species in 10 genera, *Scrophulariaceae* is the fourth largest vascular plant family in the Tassajara region, and includes some of the most common and/or showiest of the region's wildflowers.

1a. Leaves alternate or mostly alternate (whorled at the base and the lower-most cauline often opposite or in three's in *Linaria*):
2a. Flowers not subtended by large or colorful bracts. Base of corolla tube pouched or spurred on the lower side. Upper corolla lip often two-lobed, positioned at a more or less right angle to the axis of the tube, and with flat or backwardly turned margins. The lower lip is outwardly spreading or turned downward:
3a. Corolla tubes with swollen pouch-like formations. Leaves alternate or only the basal and lower-most leaves of the branches opposite. . . ***Antirrhinum***.
3b. Corolla tubes with narrowly linear spurs. Basal leaves ("offshoots") whorled, the lower-most cauline often opposite or in three's. . . . ***Linaria***.
2b. Flowers subtended by large bracts that are petal-like in color and texture in many species. Base of corolla tube not spurred or pouched. Upper corolla lip entire, aligned with the axis of the tube, and with inwardly curved margins. The lower lip is turned upward:
4a. Leaves pinnately to bipinnately divided into sharply toothed segments. Anther-cells equal in size and position. . . . . ***Pedicularis***.
4b. Leaves simple, three-lobed, or cleft into narrowly linear segments. Anther-cells unequal in size and position, the upper attached in the middle, the lower attached at the base or abortive:
5a. Calyces united for about half of the length. Corolla narrow, the lower lip shorter than the upper lip. . . . . ***Castilleja***.
5b. Calyces divided to the base. Corolla laterally expanded, the lower lip about as long as the upper lip. . . . . ***Cordylanthus***.
1b. Leaves opposite:
6a. Calyces united for at least one third of the length. Sterile stamen absent or just a small rudiment:
7a. Calyces united for most of the length, the lobes very short. Corolla not swollen at the base. Stigma cleft into two lobes. . . ***Mimulus***.
7b. Calyces deeply lobed. Corolla base swollen on the upper side. Stigma entire. . . . . ***Collinsia***.
6b. Calyces divided to or nearly to the base. Sterile stamen well developed:
8a. Plants of wet or moist habitats. Stems four-angled. Corollas about 8 to 12 mm. long. . . . . ***Scrophularia***.
8b. Plants of dry habitats. Stems round. Corollas about 12 to 40 mm. long:
9a. Upper corolla lip nearly straight or turned downward. All filaments strongly pubescent at the base. . . . . ***Keckiella***.
9b. Upper corolla lip turned upward. Filaments glabrous or only two slightly pubescent at the base. . . . . ***Penstemon***.

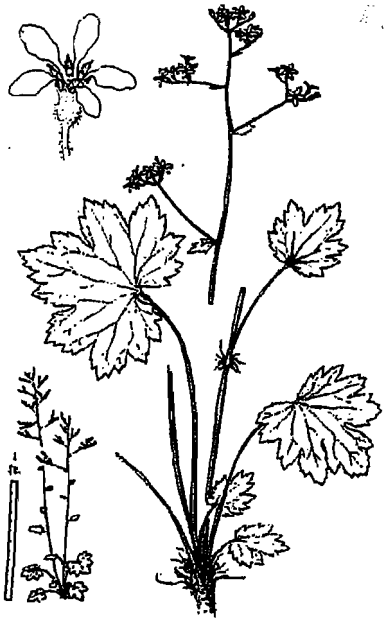
ANTIRRHINUM. SNAPDRAGON.

About 36 species of western North America and southern and southwestern Europe. The domestic snapdragon is *Antirrhinum majus*.

1a. Upper stems weak, twining, and often supported by coiling capillary pedicels. Capsules symmetrical. . . . . ***A. kelloggii***.
1b. Upper stems not weak or twining. Capsules asymmetrical due to a displacement of the upper and lower halves. . . . . ***A. multiflorum***.

Antirrhinum kelloggii Greene [*A. strictum* Gray, *Asarina stricta* (Hooker & Arnott) Pennell]. LAX SNAPDRAGON (P. 169). *HABIT*: annual herbs with at first erect but upwardly weak and vine-like stems ranging from about 1 to 8 dm. (4-32") long. *LEAVES*: alternate, short petiolate to nearly sessile, the blades mostly lanceolate and about 1 to 5 cm. long, the upper-most passing into narrowly linear bracts. *INFLORESCENCE*: the flowers are produced in the axils of the leaves for most of the length of the plant, on slender pedicels about 3 to 9 cm. long, which are often tendril-like and coiling around the stems of other plants. *COROLLA*: bilabiate, about 10 to 14 mm. long, lavender to deep bluish-purple, and with a white but purple-veined palate. *FRUIT*: a roundish capsule about 5 to 7 mm. long. *OCCURRENCE*: this is an ephemeral "burn-species" that has rarely been collected anywhere within its range except during the first few years after a fire. Although I have not seen this species in this region, Miriam Bobcoff report it from the vicinity of Tassajara Hot Springs during the first few years after the Marble-Cone Fire of 1977. It has also been collected along Indians Road 2.1 miles southeast of the Arroyo Seco Guard Station, and thus in the vicinity of the confluence of Tassajara Creek and the Arroyo Seco River (Breedlove #2340 DS, SBBG, UCSB, re. Thompson '88). It is quite possible that this species is now temporarily extinct in this region. *DISTRIBUTION*: Coast Ranges, western Transverse Ranges and Peninsular Ranges, from Napa and Sonoma Counties to northern Baja California, and occurring mostly within 40 miles from the coast. Also on Santa Cruz and Santa Catalina Islands. ⊛April-June.

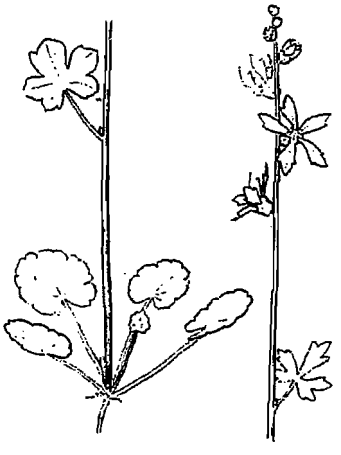
Antirrhinum multiflorum Pennell [*A. glandulosum* Lindley]. STICKY SNAPDRAGON (P. 169). *HABIT*: annual or short-lived perennial herbs with erect or ascending and laterally branched stems ranging from about 6 to 15 dm. (2-5') long. *LEAVES*: generally alternate and sessile, the blades narrowly lanceolate to oblong or linear, entire, and about 1 to 6 cm. long. *INFLORESCENCE*: the flowers are produced in elongated



Boykinia occidentalis

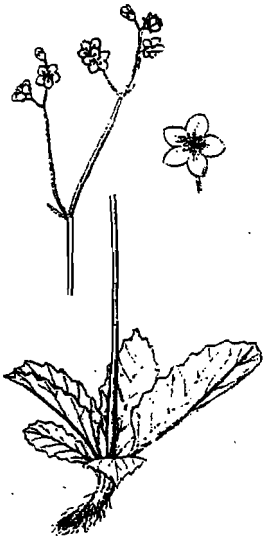
Heuchera micrantha

Lithophragma affine



Lithophragma heterophyllum

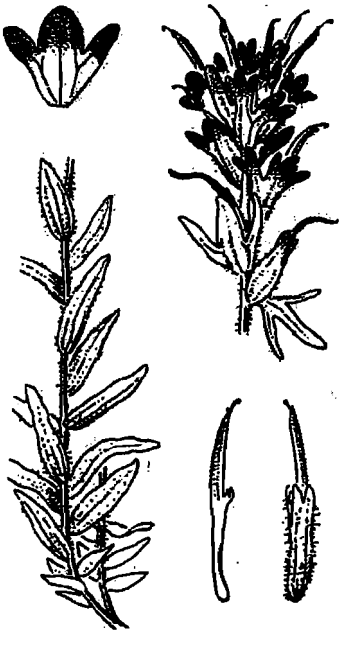
Parnassia californica



Saxifraga californica

Antirrhinum kelloggii

Antirrhinum multiflorum



Castilleja applegatei martinii

terminal racemes, and sometimes in few-flowered racemes terminating the lateral branches. *COROLLA*: bilabiate and about 13 to 18 mm. long, mostly pale-pink to carmine with the lobes tending to be darker-hued, and with a white and upwardly inflated palate. *FRUIT*: an oblique-ovoid capsule about 7 to 11 mm. long. *OCCURRENCE*: scattered in open and often rocky or disturbed habitats in the Tassajara region, but currently very rare. During the middle to late 1980's this species was generally uncommon but widely scattered in suitable habitats, but in the current decade I have not seen any plants. In contrast, Vern Yadon ('79 a & b, '80 e & f) reported this species to be common to abundant on some of the higher ridges of this region two to three years after the Marble-Cone Fire of 1977. The aftereffects of the Marble Cone Fire is thus certainly the basis of Thompson's perception that this species is "remarkably abundant" in "the Arroyo Seco region of Monterey Co." (Thompson '88). *DISTRIBUTION*: Coast Ranges and Transverse Ranges, from Alameda and Santa Cruz Counties to the San Bernardino Mts. of San Bernardino Co. Also in the Sierra Nevada Foothills of Calaveras and Tuolumne Counties, and on Santa Cruz Island. ⊛May-Aug.

CASTILLEJA. PAINTBRUSH, OWL'S-CLOVER.

Approximately 200 species primarily of western North America. Most of the species are partially parasitic on the roots of other plants.

1b. Perennial herbs, sometimes slightly woody at the base:
2a. Plants dark green and glandular. . . . . ***C. applegatei.***
2b. Plants densely whitish to grayish-woolly and not glandular. . . . . ***C. foliolosa.***
1a. Annual herbs:
3a. Plants of wet or seasonally wet habitats. Leaves entire. Floral bracts entire and distally red. Lower corolla lip less than ¼ the length of the upper lip. . . . . ***C. minor.***
3b. Plants mainly of open grassland habitats. Leaves or some leaves divided into narrow segments. Floral bracts divided into narrow segments that are tipped white or rose-lavender. Lower corolla lip at least ½ the length of the upper lip:
4a. Inflorescence narrow and pale. Upper corolla lip straight. . . . . ***C. attenuata.***
4b. Inflorescence broad and colorful. Upper corolla lip hooked at the apex. . . . . ***C. exserta.***

Castilleja applegatei Fernald subsp. **martinii** (Abrams) Chuang & Heckard [*C. martinii* Abrams, *C. roseana* Eastwood]. INDIAN PAINT BRUSH (P. 169). *HABIT*: evergreen perennial herbs with few to many erect or ascending stems ranging from about 2 to 8 dm. (8-32") tall. *LEAVES*: alternate and sessile, the blades about 1 to 7 cm. long, the lower narrowly oblong to lanceolate and the upper generally oblanceolate in outline and three-lobed at the apex. The margins are usually wavy. *INFLORESCENCE*: very showy terminal racemes in which the flowers are subtended by three-lobed bracts that are distally deep red to scarlet. The calyx lobes are of the same color. *COROLLA*: narrowly bilabiate, about 2.5 to 4 cm. long, and with an upper lip about as long to longer than the tube, while the much reduced lower lip is dark green and about 1 to 3 mm. long. *FRUIT*: a many-seeded capsule about 8 to 15 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, primarily in open and often rocky places, and one of the showiest of the region's wildflowers. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Lake Co. to northern Baja California. ⊛April-Aug.

Castilleja attenuata (Gray) Chuang & Heckard [*Orthocarpus attenuatus* Gray]. VALLEY-TASSELS (P. 173). *HABIT*: small and fairly inconspicuous annual herbs with erect stems ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: alternate and sessile, the blades linear to linear-lanceolate and about 1 to 6 cm. long, the upper commonly with two lateral lobes. *INFLORESCENCE*: the flowers are produced in narrow terminal racemes, and are subtended by bracts that are divided into three white-tipped lobes. *COROLLA*: narrowly bilabiate, whitish to yellowish, and about 10 to 25 mm. long. The erect upper lip is narrowly linear and about 4 or 5 mm. long, while the shorter lower lip is broad, three-lobed, and with purple spots. *FRUIT*: an elliptic capsule about 6 to 10 mm. long. *OCCURRENCE*: lightly scattered in small colonies in open grassland habitats in the Horse Pasture and in Pine Valley. Although this species was not seen elsewhere in this region, I suspect that it is more widely scattered in grassland habitats along the entire length of the Church Creek Fault Zone (the geological formation that includes both the Horse Pasture and Pine Valley). *DISTRIBUTION*: western North America, from British Columbia to northern Baja California. Also native to Chile. ⊛March-May.

Castilleja exserta (Heller) Chuang & Heckard [*Orthocarpus purpurascens* Bentham]. OWL'S CLOVER, ESCOBITA, PINK PAINTBRUSH (P. 173). *HABIT*: erect annual herbs with simple or branched stems ranging from about 1 to 4 dm. (4-16") tall. *LEAVES*: alternate, sessile, about 1 to 5 cm. long, and divided into five to nine narrowly linear segments. *INFLORESCENCE*: the flowers are crowded in head-like terminal racemes, and subtended by bracts that are cleft into five to seven lobes. The lobes of the bracts and calyces are tipped with rose or rose-lavender. *COROLLA*: bilabiate, about 12 to 30 mm. long, and mostly rose or rose-lavender. The upper lip is narrow, hooked, and with a dense pubescence of the same color, while the lower lip is broad, swollen, three-lobed, and distally white to yellowish with dark rose-lavender spots. *FRUIT*: an ovoid capsule about 1 to 1.5 cm. long. *OCCURRENCE*: widely scattered and locally common, usually in colonies, in open grassland habitats in the Tassajara region, and one of the most conspicuous of the local wildflowers. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Mendocino Co. to northern Baja California, and the Sierra Nevada Foothills, from Tuolumne Co. to Nevada Co. Also in Arizona and Sonora, Mexico. ⊛April-May.

Castilleja foliolosa Hooker & Arnott. WOOLLY INDIAN PAINTBRUSH (P. 173). *HABIT*: semi-shrubby and densely white to grayish-woolly evergreen perennial herbs with erect or ascending stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: alternate, sessile, and often with small roundish to linear fascicles crowded in the axils, the blades linear to narrowly oblong, about 1 to 4 cm. long, the upper mostly with two lateral lobes. *INFLORESCENCE*: the flowers, which are subtended by three to five-lobed bracts, are crowded in terminal racemes. The lobes of the upper bracts and calyces are bright red to orangish-red, or sometimes yellow. *COROLLA*: narrowly bilabiate, about 18 to 25 mm. long, and red to orangish-red or sometimes yellow. The upper lip is about as long as the tube, while the dark green lower lip is only about 2 mm. long. *FRUIT*: a many-seeded capsule about 10 to 15 mm. long. *OCCURRENCE*: widely scattered and locally common in openings in chaparral and in transitional areas in the Tassajara region, especially in rocky areas. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Humboldt Co. to northern Baja California. Also in the Sierra Nevada Foothills, but rare. ⊛April-June.

Castilleja minor (Gray) Gray subsp. **spiralis** (Jepson) Chuang & Heckard [*C. stenantha* A. Gray] (P. 173). *HABIT*: annual herbs with simple or sometimes branched stems ranging from about 3 to 15 dm. (1-5') tall. *LEAVES*: alternate, narrowly lanceolate to linear, entire, and about 2 to 10 cm. long. *INFLORESCENCE*: the flowers are produced spike-like terminal racemes about 1 to 4 dm. long, with the lower flowers often produced in the axils of the upper leaves, and the upper subtended by

red-tipped bracts. *Corolla*: narrowly bilabiate, yellowish to dull reddish, and about 25 to 35 mm. long. The upper lip is nearly as long as the tube, while the lower lip is only about 2 to 3 mm. long. *Fruit*: an ovoid capsule about 10 to 15 mm. long. *Occurrence*: widely scattered in wet or seasonally wet habitats in the Tassajara region, mostly in rocky areas along streams, but uncommon. *Distribution*: Coast Ranges, Central Valley, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Lake, Colusa and Toulumne Counties to San Diego Co. ⊛May-Sept.

COLLINSIA. Chinese Houses, Blue-Eyed Mary.

About 18 species of North America, but primarily of California. Sixteen species occur within the state, and ten (plus five lesser taxa) are endemic to the California Floristic Province.

1a. Pedicels shorter than the calyces. Corollas 10 to 20 mm. long. . . . . ***C. heterophylla.***
1b. Pedicels of at least the lower flowers longer than the calyces. Corollas 4 to 10 mm. long:
2a. Larger leaves abruptly constricted at the base. Inflorescence not glandular. . . . . ***C. parryi.***
2b. Larger leaves gradually narrowed to the base. Inflorescence glandular. . . . . ***C. childii.***

⇧**Collinsia childii** Parry ex Gray. Little Blue-Eyed Mary (p. 173). *Habit*: fairly inconspicuous annual herbs with erect and usually simple stems ranging from about 1 to 4 dm. (4-16") tall. *Leaves*: opposite and short petiolate to nearly sessile, the blades about 1 to 4 cm. long, narrowly oblong to oblong-lanceolate or oblanceolate, and with remotely serrulate to nearly entire margins. *Inflorescence*: the flowers are produced in terminal racemes, with the lower usually opposite in the axils of the upper leaves and the upper generally in loose whorls at the nodes. *Corolla*: bilabiate, about 6 to 8 mm. long, and pale-violet or sometimes nearly white. *Fruit*: a roundish capsule about 3 to 4 mm. long. *Occurrence*: scattered in semi-shady but generally grassy areas within mixed evergreen forests at higher elevations in the Tassajara region, such as along Tassajara Rd. between Lime Point and the bathtub spring, along the road to The Caves, along the Pine Ridge Trail, on Chew's Ridge, in Pine Valley, etc. *Distribution*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Monterey and Mariposa Counties to San Diego Co., and occurring mostly between 3,000 and 7,000 ft. ⊛April-June.

Collinsia heterophylla Buist [*C. bicolor* Bentham]. Chinese Houses, Innocence (p. 173). *Habit*: showy-flowered annual herbs with erect or ascending stems ranging from about 1 to 5 dm. (4-20") tall. *Leaves*: opposite, the lower short-petiolate and the upper sessile, the blades about 1 to 7 cm. long, lanceolate to lance-oblong or linear, and with remotely serrulate or sometimes entire margins. *Inflorescence*: the flowers are produced at the nodes of a terminal and generally conically-shaped raceme, with the lower-most flowers commonly singular or opposite in the axils of the upper leaves, and the upper flowers congested in whorls. *Corolla*: bilabiate, about 10 to 20 mm. long, and extremely variable in coloration, ranging from (rarely) pure white to uniformly dark reddish-purple. In most plants the lobes are darker than the tube, with the lower lobes darker than upper lobes, but plants in which the upper lobes are the darkest are fairly common. *Fruit*: a roundish capsule about 5 mm. long. *Occurrence*: widely scattered and locally common to abundant in more or less shady but grassy woodland habitats in the Tassajara region, and occurring mostly below about 3,000 ft., but occasionally up to nearly 5,000' (such as on Chew's Ridge). *Distribution*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Humboldt and Shasta Counties to northern Baja California. ⊛ April-June.

⇧**Collinsia parryi** Gray [*C. antonina* Hardham including subsp. *purpurea* Hardham]. Long-Pedicelled Chinese Houses (p. 173). *Habit*: annual herbs with erect or ascending stems ranging from about 2 to 6 dm. (8-24") tall. *Leaves*: opposite but occasionally in three's, the lower petiolate and the upper sessile or nearly so, the blades are about 1 to 4.5 cm. long, those of the larger leaves lanceolate to lance-oblong and abruptly constricting to the petiole, and the margins are remotely toothed or entire. *Inflorescence*: the flowers are produced at the nodes of terminal racemes, with the lower flowers usually opposite in the axils of the leaves on long and slender pedicels, while the upper flowers are generally shortly pediceled and produced in loose whorls. *Corolla*: bilabiate, about 4 to 10 mm. long, and light to darkish reddish-purple, the lobes darker than the throat. *Fruit*: a roundish capsule about 5 mm. long. *Occurrence*: lightly scattered in more or less shady (but grassy) woodland habitats in the vicinity of Tassajara Hot Springs, and perhaps in other areas of the Tassajara region. *Distribution*: Transverse Ranges, from Santa Barbara Co. to the San Gabriel and San Bernardino Mts., with a disjunct population scattered in the Santa Lucia Mts. of Monterey Co. ⊛March-May.

CORDYLANTHUS. Bird's Beak.

Eighteen species of western North America. The genus is well represented in California, for sixteen species occur within the state, and nine (plus 14 lesser taxa) are endemic to the California Floristic Province.

Cordylanthus rigidus (Gray) Jepson. Bird's-Beak, Mule-Weed (p. 173). *Habit*: annual herbs with branching stems ranging from about 3 to 10 dm. (12-40") tall. *Leaves*: alternate, sessile, and about 1 to 3 cm. long, the blades narrowly linear with the larger divided into three linear segments. *Inflorescence*: the flowers are produced few to many-flowered head-like terminal clusters, and subtended by three-lobed bracts that are commonly tinged purplish. *Corolla*: bilabiate and about 12 to 20 mm. long (but largely obscured by the two sepals which are of about equal length), laterally expanded and with lips of about equal length (and thus resembling a bird beak), pale green to yellowish, purplish-tinged distally, and with a U-shaped spot on the lower side. *Occurrence*: widely scattered and locally common in the Tassajara region, especially in grassy or rocky openings in chaparral. *Distribution*: Coast Ranges, Sierra Nevada Foothills, and western Transverse Ranges, from San Mateo, Alameda and Tuolumne Counties to Santa Barbara and Ventura Counties. *Note*: although all the closely observed plants of this region corresponded to the typical species, it is possible that some of the local plants, especially those which occur on the higher peaks in the western area of the Tassajara region, may represent pure or integrated forms of the Santa Lucia Mts. race [*C. r.* var. *sylvaticus* Jepson], which occurs on the Coast Ridge between the summit of Nacimiento Road and Post's Summit above Big Sur (Chuang & Heckard '86). The floral bracts of such plants have short and relatively broad lobes that are shorter than the flowers (as opposed to long and narrow lobes about as long or longer than the flowers). ⊛July-Sept.

KECKIELLA.

Seven species of southwestern temperate North America, but primarily of California. All of the species occur within the state, and five (plus four lesser taxa) are endemic to the California Floristic Province. Segregated from *Penstemon*.

1a. Plants with distally herbaceous branches 5 to 20 dm. long. Leaves narrowly lanceolate to narrowly oblanceolate. Corollas white to pale pink with pinkish to purplish lines, 12 to 18 mm. long, the tube mostly included within the calyx. Widely distributed in suitable habitats. . . . . ***K. breviflora.***

1b. Plants with generally woody branches 2 to 6 dm. long. Leaves ovate to oblong-elliptic. Corollas red, 22 to 40 mm. long, the tube well exserted from the calyx. Restricted to cliffs and major rock outcrops. . . . . ***K. corymbosa.***

Keckiella breviflora (Lindley) Straw [*Penstemon breviflorus* Lindley]. GAPING PENSTEMON, BUSH BEARD-TONGUE (P. 173). *HABIT*: lanky subshrubs with sprawling and outwardly herbaceous branches ranging from about 5 to 20 dm. (20-80") long. *LEAVES*: opposite, nearly sessile, the blades about 1 to 5 cm. long, mostly narrowly lanceolate to narrowly oblanceolate, and with entire to serrulate margins. *INFLORESCENCE*: the flowers are produced in leafy and generally pyramidal-shaped terminal panicles. *COROLLA*: bilabiate and about 12 to 18 mm. long, mostly white but tinged with rose, and with pinkish to purplish markings and lines. The upper lip arches outward, while the lower lip is reflexed downward and backward, giving the flowers a "gaping" or "yawning" appearance. *FRUIT*: an ovoid capsule. *OCCURRENCE*: widely scattered and locally common to abundant in the Tassajara region, and occurring primarily in areas that are transitional between major habitat types, and sometimes forming thickets. *DISTRIBUTION*: Coast Ranges, Sierra Nevada and western Transverse Ranges, from Mendocino Co. and the Lake Tahoe region to Los Angeles Co. ⊛May-July.

⇩**Keckiella corymbosa** (Bentham) Straw [*Penstemon corymbosus* Bentham]. REDWOOD PENSTEMON (P. 175). *HABIT*: small shrubs with spreading to ascending branches ranging from about 3 to 5 dm. (12-20") long. *LEAVES*: opposite, short-petiolate or sessile, the blades about 1 to 3.5 cm. long, mostly ovate to oblong-elliptic, and with remotely toothed margins. *INFLORESCENCE*: the showy flowers are produced in corymbose panicles. *COROLLA*: bilabiate, deep red, and about 2 to 4 cm. long. The tube is generally longer than the lips and well exserted from the calyx, the upper lip is relatively straight, and the lower lip is strongly deflexed. *FRUIT*: an ovoid and many-seeded capsule. *OCCURRENCE*: widely scattered on cliffs and major rock outcrops in the Tassajara region, and fairly common in some areas, such as at The Narrows around the waterfalls of Waterfall Creek. *DISTRIBUTION*: Coast Ranges, from Del Norte Co. to the Santa Lucia Mts. of Monterey Co., and (according to Munz '59) in the Sierra Nevada, from Shasta Co. to Sutter Co. ⊛June-Oct.

LINARIA. TOAD-FLAX.

A primarily Eurasian genus comprised of approximately 100 species.

Linaria canadensis (Linnaeus) Dumont de Courset [*L. texana* Scheele, *L. c.* var. *t.* (Scheele) Pennell]. BLUE TOAD-FLAX (P. 175). *HABIT*: delicate annual herbs with slender and erect stems ranging from about 1 to 6 dm. (4-24") tall. *LEAVES*: the basal leaves, which are technically offshoots and produced in rosettes, are about 1 to 5 cm. long, and with small oblanceolate to narrowly linear segments that are opposite or whorled in three's at the nodes, while the cauline leaves are sessile, narrowly linear, and about 5 to 25 mm. long, the lower-most commonly opposite or in three's and the upper alternate. *INFLORESCENCE*: the flowers are produced in terminal spike-like racemes. *COROLLA*: strongly bilabiate with narrow and downwardly curved spurs at the lower base, about 10 to 24 mm. long, and mostly blue or blue-violet. *FRUIT*: a roundish capsule about 3 mm. long that contains numerous minute seeds. *OCCURRENCE*: scattered in open and grassy habitats below about 3,000 ft. in the Tassajara region, but uncommon. I have seen only a few plants in the Horse Pasture and on the south slope of the small ridge immediately south of the developed area of Tassajara Hot Springs. *DISTRIBUTION*: widely scattered in North and South America, from British Columbia and Virginia to Chile and Argentina. ⊛April-May.

MIMULUS. MONKEY-FLOWER.

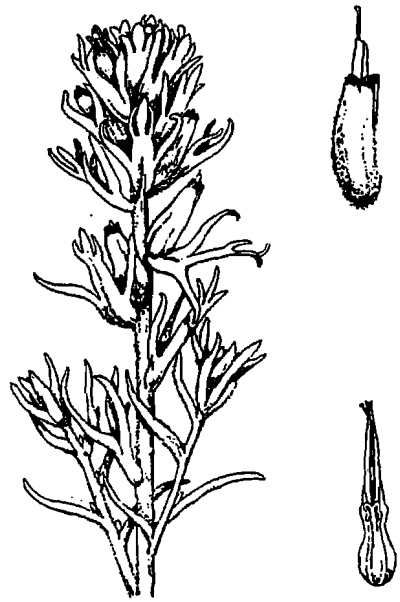
About 100 species primarily of temperate western North America, but also of southwestern South America (Chile), East Asia, southern Africa, Australia and New Zealand. The genus is well represented in California, for at least 63 species occur within the state, and about 34 are endemic to the California Floristic Province.

1a. Plants of wet or moist habitats, such as streambeds, springs, seeps, etc.:
2a. Corollas red to reddish-orange. . . . . ***M. cardinalis.***
2b. Corollas bright yellow with red spots:
3a. Corollas 15 to 40 mm. long, strongly bilabiate, and with the throat nearly closed by an upwardly swollen palate. . . . . ***M. guttatus.***
3b. Corollas 7 to 15 mm. long, weakly bilabiate, and with an open throat. . . . . ***M. floribundus.***
1b. Plants of dry habitats:
4a. Shrubs or subshrubs. Corollas 40 to 60 mm. long, and orangish to peach or saffron. . . . . ***M. aurantiacus bifidus.***
4b. Annuals herbs. Corollas 8 to 40 mm. long, and reddish-purple to lavender or pink:
5a. Flowers singular at the nodes. . . . . ***M. fremontii.***
5b. Flowers mostly opposite at the nodes. . . . . ***M. bolanderi.***

Mimulus aurantiacus Curtis subsp. **bifidus** (Pennell) Yadon [*M. bifidus* Pennel subsp. *fasciculatus* Pennel, *Diplacus f.* McMinn, *M. leptanthus* Nuttall in part]. SANTA LUCIA STICKY MONKEY FLOWER (P. 175). *HABIT*: evergreen shrubs or subshrubs typically with rounded crowns ranging from about 4 to 10 dm. (16-40") tall. *LEAVES*: glandular (sticky), opposite, mostly linear-oblong or elliptic with revolute margins, and about 2 to 6 cm. long. Smaller leaves are clustered in the axils of the primary leaves. *INFLORESCENCE*: the showy flowers are often produced in abundance in the axils of leafy terminal racemes. *COROLLA*: bilabiate, pale-orange to peach or saffron, about 4 to 6 cm. long, and with deeply cleft lobes. *FRUIT*: a many-seeded capsule. *OCCURRENCE*: widespread and locally common to abundant in the Tassajara region, and occurring mostly in transitional habitats and in openings in chaparral, especially in rocky areas. *DISTRIBUTION*: mostly in the Santa Lucia Mountains of Monterey and San Luis Obispo Counties, but also in the Pinnacles region of the Gavilan Mountains to the east, and the La Panza Range to the southeast. *NOTE*: although Thompson (in Hickman, ed., '93) reduced all taxa of the subgenus *Diplacus* (ex-

Castilleja attenuata

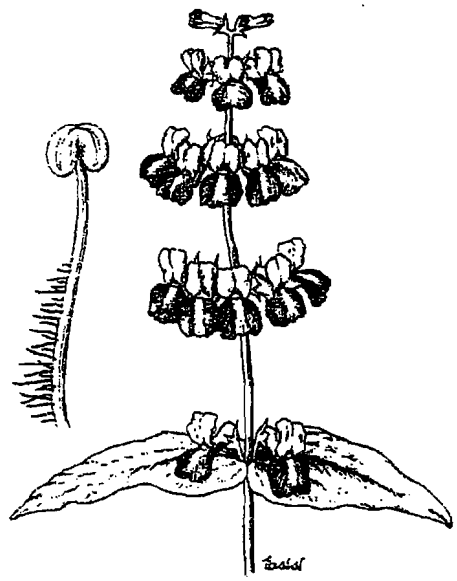
Castilleja exserta



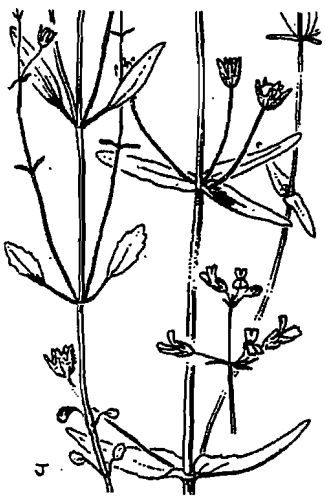
Castilleja foliolosa

Castilleja minor spiralis

Collinsia childii



Collinsia heterophylla



Collinsia parryi

Cordylanthus rigidus

Keckiella breviflora

cept *M. clevelandii*) to synonymy under *M. aurantiacus*, the nomenclature used here is that proposed by Vern Yadon (Matthews '97). Even if this taxon is genetically fully compatible with *M. aurantiacus*, the distinct morphological characteristics (especially the larger and much showier corollas with deeply bifid lobes) warrant taxonomic recognition, at least at a varietal level. ⊛May-July.

Mimulus bolanderi Gray. TOBACCO MONKEY FLOWER (P. 175). *HABIT*: annual herbs with erect or ascending stems varying from just a few cm. tall to up to 9 dm. tall (1-36"). The plants emit a tobacco-like odor. *LEAVES*: opposite and short petiolate, the blades obovate to oblanceolate or narrowly oblong, entire or remotely toothed towards the apex, and about .5 to 6 cm. long. *INFLORESCENCE*: the flowers are produced in the axils of the leaves, the lower often singular, but the upper usually opposite. *COROLLA*: bilabiate, about 12 to 30 mm. long, and pale pink to dark reddish-purple, with two white lines cresting the folds on the lower side. *FRUIT*: a slender capsule about 7 to 13 mm. long. *OCCURRENCE*: known to occur in this region only in chaparral at the northwestern edge of Pine Valley, but as this is a species that primarily occurs in disturbed chaparral habitats, especially after fires, it is possible that it is more widely scattered in the Tassajara region. *DISTRIBUTION*: Coast Ranges, the Sierra Nevada (especially the foothills), and western Transverse Ranges, from Mendocino and Calaveras Counties to Santa Barbara Co. ⊛May-Oct.

Mimulus cardinalis Douglas. SCARLET MONKEY-FLOWER (P. 175). *HABIT*: rhizomatic perennial herbs with erect to decumbent stems ranging from about 2.5 to 8 dm. (10-32") long. *LEAVES*: opposite, the lower short petiolate and the upper sessile, the glandular blades about 2 to 8 cm. long, broadly elliptic to obovate, and with irregularly serrate margins. *INFLORESCENCE*: the showy flowers are singular and opposite in the axils of the upper leaves on pedicels about 5 to 8 cm. long. *COROLLA*: about 4 to 5 cm. long, bilabiate with strongly reflexed lobes, and generally scarlet-red but often varying towards orange or yellow. *FRUIT*: a many-seeded capsule about 16 to 18 mm. long. *OCCURRENCE*: widely scattered and fairly common in the streambeds of perennial or mostly perennial streams in the Tassajara region, especially in fully exposed areas. *DISTRIBUTION*: western North America, from Oregon to Utah, New Mexico and northern Baja California. ⊛May-Oct.

Mimulus floribundus Douglas ex Lindley. FLORIFEROUS MONKEY FLOWER (P. 175). *HABIT*: annual herbs with erect to decumbent and usually much-branched stems ranging from about 1 to 5 dm. (4-20") long. *LEAVES*: opposite and with petioles 1 to 20 mm. long, the blades about .5 to 4.5 cm. long, ovate to slightly lance-ovate with toothed margins, rounded to subcordate at the base, and clammy and somewhat sticky to the touch. *INFLORESCENCE*: the flowers are axillary on slender pedicels about 5 to 30 mm. long. *COROLLA*: about 6 to 15 mm. long, scarcely bilabiate, and yellow with red spots on the throat. *FRUIT*: a many-seeded capsule about 4 to 7 mm. long. *OCCURRENCE*: widely scattered along perennial streams and sometimes at springs or seeps in the Tassajara region, but generally uncommon. *DISTRIBUTION*: western North America, from British Columbia and South Dakota to northern Mexico. ⊛April-Aug.

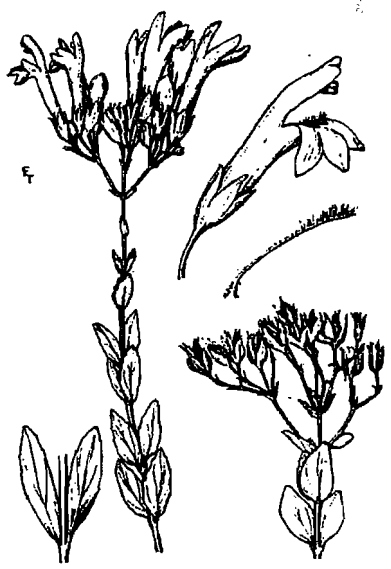
⇧Mimulus fremontii (Bentham) Gray [*M. subsecundus* Gray]. ONE SIDED MONKEY FLOWER (P. 175). *HABIT*: small and highly variable annual herbs with erect or ascending stems ranging from about .4 to 2 dm. (1-8") tall, with depauperate plants often having only two leaves and one flower. *LEAVES*: opposite, sessile, and entire, the blades about 1 to 3 cm. long, oblong to broadly oblanceolate, and commonly reddish to purplish-tinged, especially below. *INFLORESCENCE*: the flowers are produced in the axils of the leaves on short pedicels. *COROLLA*: bilabiate and about 1.5 to 2.5 cm. long, and varying from rose-violet to dark reddish-purple, and often with two yellow ridges on the throat. *FRUIT*: a many-seeded capsule about 7 to 13 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, mostly in open grasslands or in grassy openings in chaparral, but uncommon. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from San Benito and Monterey Counties to northern Baja California. *NOTE*: most of the plants of this region correspond to the description of what has been recognized as *M. subsecundus*, which differs from typical *M. fremontii*-like plants by having smaller, darker hued corollas with yellow ridges on the throat. ⊛April-July.

Mimulus guttatus deCandolle [*M. nasutus* Greene]. COMMON MONKEY-FLOWER (P. 175). *HABIT*: highly variable annual or sometimes rhizomatic perennial herbs with generally weak and often hollow stems ranging from about .5 to 10+ dm. (2-40+") long; the stems are often decumbent for a considerable length and root at the nodes. *LEAVES*: opposite and with serrately toothed margins, the lower with petioles up to 9 cm. long (those of larger leaves sometimes pinnately lobed or toothed), and with roundish to broadly ovate blades up to 12 cm. long. The upper leaves are gradually reduced in size and become sessile (the upper-most often fused at the base), and have broadly to narrowly ovate blades. *INFLORESCENCE*: the showy flowers are opposite at the nodes of terminal racemes, on pedicels about .5 to 6+ cm. long. *COROLLA*: strongly bilabiate, about 1 to 4 cm. long, bright-yellow and with red spots on the upwardly swollen palate. *FRUIT*: a capsule about 5 to 10 mm. long; the capsule is concealed within the persistent calyx. *OCCURRENCE*: widely scattered and locally common along perennial streams in the Tassajara region, and occasionally at springs and seeps. *DISTRIBUTION*: widespread in riparian habitats in western North America, from Alaska to northern Mexico. *NOTE*: occasionally plants are encountered in this region, mostly in intermittently wet areas, that are fairly depauperate and with smaller corollas. Such plants are referable to what was recognized by Greene as *M. nasutus*. ⊛April-Oct.

PEDICULARIS. LOUSEWORT, ELEPHANT HEADS.

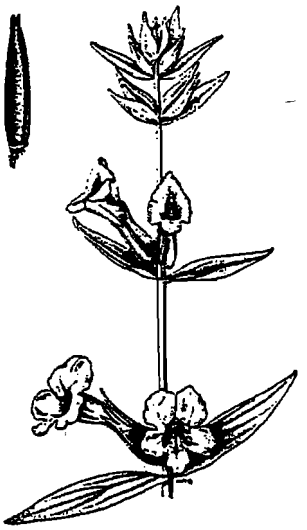
About 500 species primarily of northern temperate and boreal regions, but also of South America, and primarily of cool and/or wet habitats. The plants are partially parasitic on the roots of other plants.

Pedicularis densiflora Bentham ex Hooker. INDIAN WARRIOR (P. 175). *HABIT*: deciduous and reddish-tinged perennial herbs with one to several erect or ascending stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: alternate and petiolate, the blades about 5 to 20 cm. long, broadly lanceolate to elliptic or oblanceolate in outline, and pinnately or bipinnately divided into sharply toothed segments. *INFLORESCENCE*: the flowers are crowded in head-like terminal racemes about 4 to 12 cm. long, and subtended by serrately-margined bracts. *COROLLA*: bilabiate, deep-red, and about 25 to 35 mm. long. The hood-like upper lip is about 8 to 17 mm. long, while the much reduced and three-lobed lower lip is only about 2 to 4 mm long. *FRUIT*: an ovate capsule about 7 to 13 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, mostly in chaparral, especially in the shade of tall and *Ceanothus* dominated chaparral, and locally common in small colonies. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from southwestern Oregon to northern Baja California. ⊛March-June.



Keckiella corymbosa

Linaria canadensis



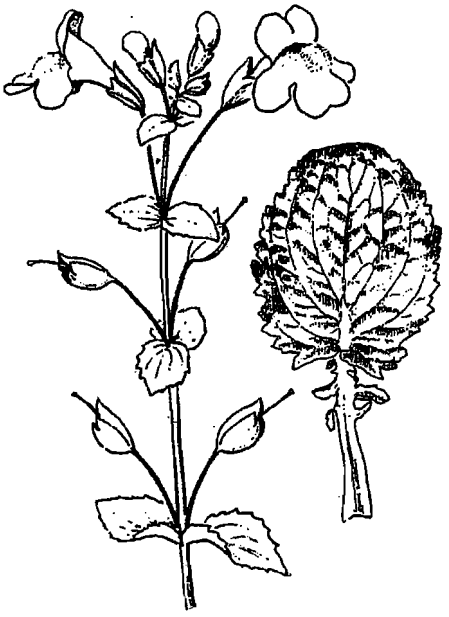
Mimulus bolanderi

Mimulus bifidus fasciculatus

Mimulus cardinalis

Mimulus floribundus

Mimulus fremontii



Mimulus guttatus

Pedicularis densiflora

PENSTEMON. PENSTEMON, BEARD-TONGUE.

About 250 species of North America, especially western North America, and perhaps the largest genus of flowering plants endemic to North America.

1a. Corollas red to orangish-red, the throat narrowly cylindrical, the lips short and faintly bilabiate. . . . . ***P. centranthifolius.***
1b. Corollas blue to purple, the throat expanded, the lips spreading and strongly bilabiate:
2a. Stems rather thick. Leaves broadly lanceolate with toothed margins. Corolla throat abruptly expanding from the tube. . . ***P. grinnellii.***
2b. Stems slender. Leaves narrowly linear with entire margins. Corolla throats gradually expanding from the tube:
3a. Plants mostly glabrous. Largest leaves 2 to 4 mm. wide. . . . . ***P. heterophyllus heterophyllus.***
3b. Plants minutely pubescent. Largest leaves generally less than 2 mm. wide. . . . . ***P. heterophyllus australis.***

Penstemon centranthifolius Benth. SCARLET BUGLER (P. 178). *HABIT*: evergreen perennial herbs with erect stems ranging from about 3 to 12 dm. (1-4') tall. *LEAVES*: opposite, entire, and about 3 to 10 cm. long. The lower-most leaves are petiolate and oblanceolate to spatulate, while the cauline leaves are sessile (the upper-most often clasping the stem at the base), and narrowly ovate to oblong-lanceolate. *INFLORESCENCE*: the showy flowers are opposite or in opposing groups of two's or three's at the nodes of a spike-like terminal raceme. *COROLLA*: narrowly tubular with small and faintly bilabiate lips, bright red to scarlet, and about 2 to 3 cm. long. *FRUIT*: a many-seeded capsule about 8 to 12 mm. long. *OCCURRENCE*: widely scattered and locally common in open habitats in the Tassajara region, especially in open areas in chaparral, and one of the showiest of the region's wildflowers. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Lake Co. to northern Baja California. Also in the northern Sierra Nevada Foothills. ⊛May-Aug.

Penstemon grinnellii Eastwood var. **scrophularioides** (Jones) Holmgren [*P. g.* subsp. *s.* (Jones) Munz, *P. palmeri* Gray var. *g.* Munz & Johnston]. BIG MOUTH PENSTEMON, FIGWORT PENSTEMON (P. 178). *HABIT*: evergreen and glaucous perennial herbs with rather thick and erect or ascending stems ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: opposite, the lower short-petiolate and the upper sessile, the blades about 4 to 9 cm. long, broadly lanceolate to oblong-elliptic, the lower with coarsely serrate margins and the upper with finely serrate margins. *INFLORESCENCE*: an elongated panicle occupying the upper half of the stems, with the showy flowers produced on opposing and one to several-flowered branches up to 7 cm. long. *COROLLA*: bilabiate, about 25 to 35 mm. long, purplish-blue to reddish-purple with the lips more darkly hued, and with a throat that is abruptly expanded beyond the calyx. *FRUIT*: a many-seeded capsule about 5 to 10 mm. long. *OCCURRENCE*: scattered in chaparral on the higher ridges the Tassajara region, such as on Black Butte (where it is locally abundant) and along the Black Cone Trail between Pine Ridge and the Elephant's Back, but apparently absent below about 3,000 ft. *DISTRIBUTION*: mostly in the southern Sierra Nevada and western Transverse Ranges, from Tulare and Kern Counties to Santa Barbara Co., and scattered at higher elevations in the south Coast Ranges, such as on Mt. Hamilton (Santa Clara Co.), the Santa Lucia Mts. (Monterey Co.), and San Benito Mt. (San Benito Co.). ⊛May-Aug.

Penstemon heterophyllus Lindley. FOOTHILL PENSTEMON, CHAPARRAL PENSTEMON (P. 178). *HABIT*: evergreen perennial herbs, sometimes slightly woody at the base, with slender and erect or ascending stems ranging from about 3 to 5 dm. (12-20") tall. *LEAVES*: opposite, sessile, narrowly linear, about 1 to 7 cm. long, and usually with smaller leaves clustered in the axils. *INFLORESCENCE*: the showy flowers are opposite or singular at the nodes of elongated and spike-like terminal racemes. *COROLLA*: bilabiate, about 25 to 35 cm. long, and generally bluish-purple to bluish-lavender. *FRUIT*: a many-seeded capsule about 4 to 6 mm. long. *OCCURRENCE*: widespread and locally common in open habitats in the Tassajara region, particularly in openings in chaparral or in areas that are transitional between major habitat types. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Humboldt Co. to San Diego Co. ⊛May-July.

⇧**Penstemon heterophyllus** var. **australis** Munz & Johnston [*P. h.* subsp. *a.* (M. & J.) Keck]. *HABIT*: differing from the typical species in having minutely pubescent stems, leaves and calyces, and in having leaves that are more narrowly linear. *OCCURRENCE*: widely scattered in Tassajara region, and about as common as the typical species, and occurring mostly in openings in chaparral or in areas that are transitional between major habitat types. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Monterey Co. to San Diego Co. ⊛ May-July.

SCROPHULARIA. FIGWORT.

About 150 species primarily of temperate regions of Eurasia, but also of temperate North America.

Scrophularia californica Chamisso & Schlechtendal. CALIFORNIA FIGWORT, BEE PLANT (P. 178). *HABIT*: fairly robust perennial herbs with erect or ascending stems ranging from about 10 to 18 dm. (3.3-6') tall. *LEAVES*: opposite and with petioles about 1 to 7 cm. long, the blades about 3 to 10+ cm. long, narrowly to broadly ovate, usually with truncate to subcordate bases, and with coarsely and often doubly serrate margins. *INFLORESCENCE*: the flowers are produced on the cymose branches of an open and terminal panicle. *COROLLA*: bilabiate, about 8 to 12 mm. long, and dull red to maroon. The throat is conspicuously enlarged, the upper lip is two-lobed, and the reduced lower lip is three-lobed. *FRUIT*: a conically shaped capsule about 6 to 8 mm. long. *OCCURRENCE*: widely scattered and locally common along streams and other generally wet habitats at lower to intermediate elevations of the Tassajara region, especially in sunny areas along smaller streams. *DISTRIBUTION*: from British Columbia to the outer Coast Ranges and western Transverse Ranges of California, as far south as the Santa Monica Mts. of western Los Angeles Co. *NOTE*: nectar-bearing disks at the inner base of the corollas make this species highly attractive to bees. ⊛April-July.

Notes on *Scrophulariaceae*.

Two of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June 1901 represent *Scrophulariaceae* species that were not found in the Tassajara region (as defined in this text): *Mimulus pilosus* (Elmer #3355 DS), and *Castilleja densiflora* subsp. *gracilis* (*Orthocarpus d.* var. *g.*) (Elmer #3352 DS). According to notes enclosed in envelopes pasted to the specimen sheets, *Mimulus pilosus* was collected in "gulch east of Higgin's Camp" (about 4.75 linear miles southwest of Tassajara Hot Springs), and *C. densiflora gracilis* was collected in "Lost Valley" (about 5.5 linear miles south of Tassajara Hot Springs).

Nearly acaulescent plants growing on sandy-soiled gentile slopes in openings in chaparral in the northwestern area of Pine Valley probably represent *M. douglasii* or perhaps *M. congdonii*. None of the plants had flowers at the time of observation, but the capsules were hard, indehiscent, and oblique-ovoid.

Cymbalaria muralis (Kenilworth Ivy) is well established on rock retaining walls at Tassajara Hot Springs, and although plants have occasionally been found in suitable habitats downstream, these plants appear to have died-out in recent years. The plants in question are delicate and vine-like herbs with broadly ovate-cordate and shallowly five to seven-lobed leaves, and have axillary flowers with bilabiate and basally spurred corollas that are mostly pale-violet, but with a white palate bearing yellow spots. Weedy about the developed area of Tassajara Hot Springs is *Veronica persica*, Winter or Persian Speedwell, small annual herbs with roundish-ovate leaves and axillary flowers with asymmetrically four-lobed corollas that are mostly blue to blue-violet. Also weedy about the developed area of Tassajara Hot Springs is *Verbascum thapsus* (Woolly Mullein), a robust and densely woolly perennial herb with erect stems terminating with long and densely floriferous spike-like racemes. The flowers differ from most members of the family in having nearly symmetrical rotate corollas and five fertile stamens.

Native *Scrophulariaceae* species that occur in the Santa Lucia Mts. near or relatively near to the Tassajara region include: *Castilleja affinis*, *Mimulus androsaceus*, *Mimulus rattanii*, *Triphysaria pusilla* (*Orthocarpus pusillus*), and *Veronica peregrina* subsp. *xalapensis*.

SOLANACEAE. NIGHTSHADE FAMILY.

A widely distributed family of about 75 to 85 genera and 2,300 to 3,000 species; the family is especially well represented in the tropical and subtropical regions of the Americas. The family includes many common vegetables, such as potatoes and eggplants (*Solanum*), tomatoes (*Lycopersicon*), tomatillos (*Physalis*), and the various peppers of the genus *Capsicum* (bell pepper, jalapeno, cayenne, etc.). Other well known plants include *Datura*, *Mandragora* (mandrake), *Petunia*, *Atropa* (belladonna), and *Nicotiana* (tobacco). Many of the species are poisonous, including the foliage of some of the common vegetables, while others have narcotic properties, such as *Nicotiana*, *Datura*, and *Atropa*.

SOLANUM. NIGHTSHADE.

A large and widely distributed genus of about 1,500 species; the genus is particularly well represented in the tropical regions of the Americas.

1a. Leaves green and about 2 to 15 cm. long. Corollas white, 3 to 6 mm. wide, and deeply lobed. . . . . ***S. americanum***.
1b. Leaves gray-green and about 1 to 4 cm. long. Corollas mostly pale-violet, 15 to 25 mm. wide, and shallowly lobed. . . ***S. umbelliferum***.

Solanum americanum Miller [*S. nodiflorum* Jacquin]. SMALL-FLOWERED NIGHTSHADE (p. 178). *HABIT*: annual or perennial herbs, sometimes shrub-like, with fairly lanky stems ranging from about 3 to 8 dm. (12-32") long. *LEAVES*: alternate, the petioles about .5 to 5 cm. long, the blades generally ovate with entire or wavy-toothed margins, and about 2 to 15 cm. long. *INFLORESCENCE*: the flowers are produced in lateral or terminal umbels. *COROLLA*: white, about 3 to 6 mm. wide, and deeply five-lobed. *FRUIT*: a greenish to black berry about 5-8 mm. wide. *OCCURRENCE*: widely scattered at lower to intermediate elevations in the Tassajara region, primarily in moist and/or semi-shady habitats, but generally uncommon, except for along Willow Creek. *DISTRIBUTION*: widely distributed in temperate North America, and perhaps introduced from South America at an early date. *NOTE*: this taxon is often mistaken for the very similar *S. nigrum*, the weedy Black Nightshade. ⊛April-Nov.

Solanum umbelliferum Eschscholtz. BLUE WITCH (p. 178). *HABIT*: evergreen perennial herbs or subshrubs typically with rounded or spreading crowns ranging from about 6 to 10 dm. (24-40") tall. *LEAVES*: alternate, the petioles about 4 to 10 mm. long, the blades gray-green, elliptic-ovate with entire margins or sometimes with two opposing lobes near the base, and about 1 to 4.5 cm. long. *INFLORESCENCE*: the aromatic flowers are produced in umbel-like clusters that are terminal and lateral on the upper stems. *COROLLA*: disk-like with crepe-like margins, mostly pale-violet, and about 15 to 25 mm. wide. Elevated in the center of the disk is a five-pointed star-like area, the points of which extend beyond the margins and thus produce small lobes, and five pairs of white-margined green spots are positioned at the base of the bright yellow and nearly united anthers. *FRUIT*: a roundish berry about 10 to 14 mm. in diameter. *OCCURRENCE*: widespread and locally common in the Tassajara region, primarily in openings in chaparral or other transitional areas. *DISTRIBUTION*: Coast Ranges, from Mendocino Co. to Santa Barbara Co. ⊛ May-July (-Oct.).

URTICACEAE. NETTLE FAMILY.

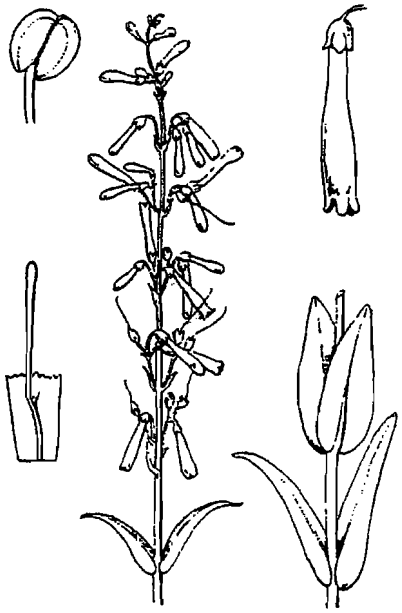
A widely distributed family comprised of about 50 genera and approximately 700 species.

URTICA. NETTLE.

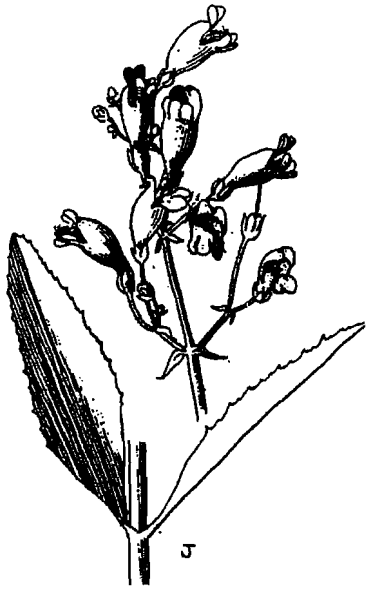
About 50 species primarily of temperate regions. Most of the species (including the two listed below) are armed with minute needle-like hairs containing a stinging fluid, the tips of which break off on contact.

1a. Perennial herbs usually more than 6 dm. tall. Leaves broadly lanceolate and about 2 to 12 cm. long. Flowers produced in elongated and generally dangling raceme or panicle-like formations. . . . . ***U. dioica***.
1b. Annual herbs less than 6 dm. tall. Leaves roundish or ovate and about 1 to 4 cm. long. Flowers produced in generally roundish clusters. ***U. urens***.

Urtica dioica Linnaeus subsp. **holoserica** (Nuttall) Thorne [*U. holosericea* Nuttall, *U. gracilis* var. *h.* Jepson]. HOARY NETTLE (p. 178). *HABIT*: rhizomatic perennial herbs with erect stems ranging from about 1 to 2+ m. (40-80+") tall. *LEAVES*: opposite and with petioles about 1 to 4.5 cm. long, the blades narrowly ovate to lanceolate with coarsely serrate margins, and about 2 to 12 cm. long. *INFLORESCENCE*: the flowers are very

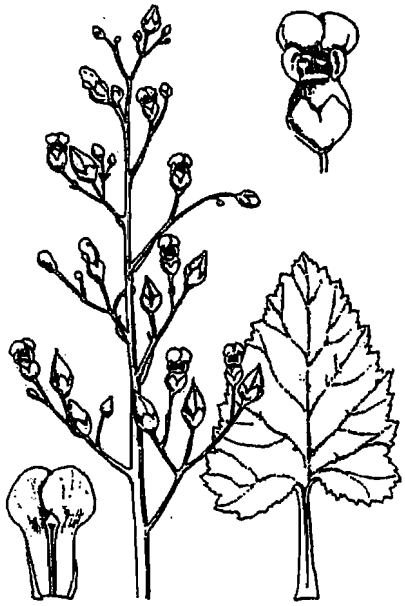


Penstemon centranthifolius



Penstemon grinnellii scrophularioides

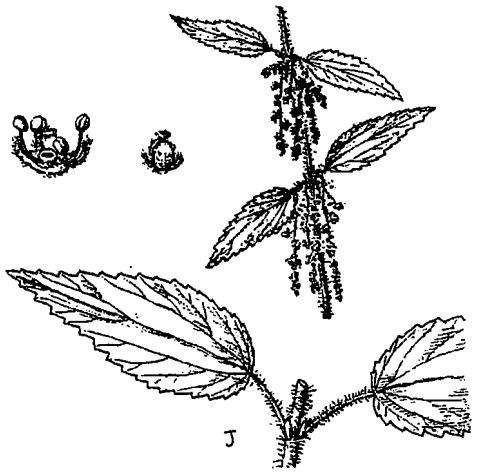
Penstemon heterophyllus



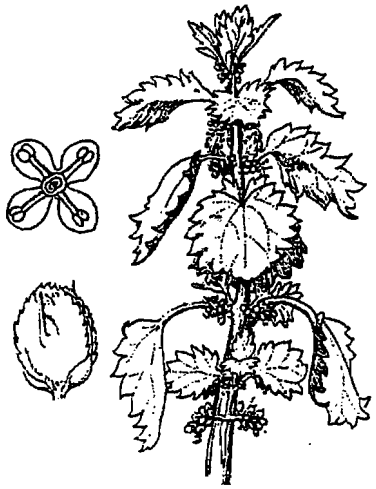
Scrophularia californica

Solanum umbelliferum

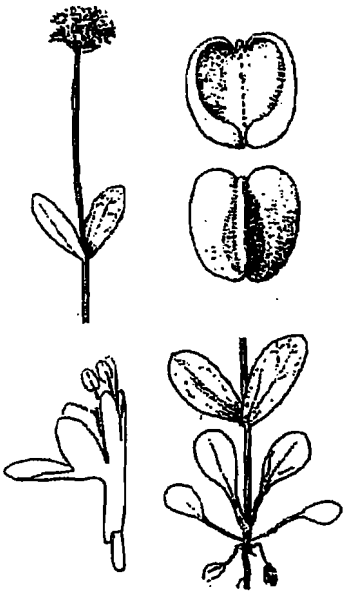
Solanum americanum



Urtica dioica holoserica



Urtica urens



Plectritis brachystemon

small and borne in elongated and generally dangling raceme or panicle-like formations that are produced in the axils of the leaves. Staminate racemes are longer and more loosely flowered than those which are pistillate. *Fruit*: an ovate akene about 1.5 mm. long. *Occurrence*: widely scattered along perennial streams in the Tassajara region. *Distribution*: western North America, from Washington and Idaho to northern Mexico. ⊛June-Sept.

***Urtica urens** Linnaeus. Dwarf Nettle, Dog Nettle (p. 178). *Habit*: annual herbs with erect stems ranging from about 1 to 5 dm. (4-20") tall. *Leaves*: opposite and with petioles about 3 to 20 mm. long, the blades roundish to ovate with deeply serrate margins, and about 1 to 4 cm. long. *Inflorescence*: the flowers are very small and produced in opposite and generally roundish axillary clusters. *Fruit*: a flattened akene about 2 mm. long. *Occurrence*: weedy in and around the developed area of Tassajara Hot Springs, and occasionally elsewhere, such as along Tassajara Cr. downstream from the hot springs. *Distribution*: a common weed in California, native to Eurasia. ⊛Jan.-April.

VALERIANACEAE. Valerian Family.

Thirteen genera and about 400 species primarily of northern temperate regions and the Andes Mountains of South America.

PLECTRITIS.

About three to five species of annual herbs of western North America and southwestern South America. As the readily observable characteristics of the species are morphologically very similar, close observation is needed to delineate between the species and lesser taxa.

1a. Corolla spur less than 1/3 as long as the tube or obsolete. Spine of the convex side of akene not grooved, the wings (if developed) thin, incurling at the base and spreading above. . . . . ***P. brachystemon.***

1b. Corolla spur about 1/3 as long to longer than the tube. Spine of the convex side of the akene with a dark grove, at least in the lower half, the wings (if developed) with thickened margins:

2a. Corollas bilabiate, pale to dark pink, usually with 2 red spots at the base of the lower lip, and with slender spurs that are often longer than the tubes. Convex side of fruits with a distinct row of coarse hairs on each side of the spine. . . . . ***P. ciliosa.***

2b. Corollas scarcely bilabiate, white to pale pink, usually without red spots, and with broad spurs that are about 1/3 to 1/2 as long as the tubes. Convex side of akenes without distinct rows of hairs. . . . . ***P. macrocera.***

Plectritis brachystemon Fischer & Meyer [*P. congesta* (Lindley) deCandolle subsp. *b.* (F. & M.) Morey]. Pink Plectritis (p. 178). *Habit*: annual herbs with erect and usually simple stems ranging from about 1.5 to 6 dm. (6-24") tall. *Leaves*: opposite and with entire or sometimes toothed margins, the lower-most petiolate with generally spatulate to obovate blades, the upper sessile and with narrowly to broadly oblong or narrowly obovate blades. *Inflorescence*: the flowers are small and produced in dense and head-like terminal clusters. *Corolla*: bilabiate, five-lobed, about 1.5 to 3.5 mm. long, and white to pale pink. *Fruit*: usually winged akenes about 2 to 4 mm. long. *Occurrence*: scattered in open woodlands along the Church Creek Fault from the upper Church Creek region to Pine Valley. *Distribution*: Pacific Slope, from British Columbia to southern California. ⊛April-May.

Plectritis ciliosa (Greene) Jepson subsp. **insignis** (Suksdorf) Morey. Long-Spurred Plectritis (p. 181). *Habit*: annual herbs with erect and usually simple stems ranging from about 1 to 5.5 dm. (4-22") tall. *Leaves*: opposite and with entire or sometimes toothed margins, the lower-most petiolate with generally spatulate to obovate blades, the upper sessile and with narrowly to broadly oblong or narrowly obovate blades. *Inflorescence*: the flowers are small and produced in dense and head-like terminal clusters. *Corolla*: bilabiate, five-lobed, light to dark pink with two red spots on the lower lobe, and about 1.5 to 3.5 mm. long. *Fruit*: a variable but usually winged akene about 2 to 4 mm. long. *Occurrence*: widely scattered on open or semi-open and usually grassy slopes at lower to intermediate elevations in the Tassajara region, and locally common in small colonies. *Distribution*: from Washington to northern Baja California and Arizona. *Note*: it is possible that the typical species may also be present in this region, for some of the specimens that I have collected have corollas up to 4 mm. long, and when taking shrinkage into account, it is possible that in living material the corollas may have been in excess of 5.5 mm. long (the taxa are distinguished by the length of the corollas, which are 1.5 to 3.5 mm. long in subsp. *insignis*, and 5.5 to 8.5 mm. long in the typical species). ⊛March-May.

Plectritis macrocera Torrey & Gray [*P. m.* subsp. *grayii* (Suksdorf) Morey]. White Plectritis (p. 181). *Habit*: annual herbs with erect and usually simple stems ranging from about 1 to 6.5 dm. (4-26") tall. *Leaves*: opposite and with entire or sometimes toothed margins, the lower-most petiolate with generally spatulate to obovate blades, the upper sessile and with narrowly to broadly oblong or narrowly obovate blades. *Inflorescence*: terminal clusters that are head-like or broken into closely spaced whorls. *Corolla*: slightly bilabiate, five lobed, white to pale pink, and about 2 to 3.5 mm. long. *Fruit*: usually winged akenes about 2 to 4 mm. long. *Occurrence*: widely scattered and locally common on grassy but semi-shady woodland slopes at lower to intermediate elevations in the Tassajara region. *Distribution*: western north America, from Washington Montana and Utah to southern California. ⊛April-May.

VERBENACEAE. Vervain Family.

About 75 genera and 3,000 species of trees, shrubs and herbs primarily of tropical and subtropical regions.

VERBENA. Vervain.

About 250 species of temperate and tropical regions of the Americas and southern Europe.

Verbena lasiostachys Link [*V. prostrata* Brown]. California Vervain (p. 181). *Habit*: perennial herbs generally with diffuse and procumbent to ascending stems ranging from about 3 to 8 dm. (12-32") long. *Leaves*: opposite and with petioles about 2 to 20 mm. long, the blades about 2 to 6 cm. long, broadly ovate to broadly elliptic, the base broadly to narrowly cuneate, and with coarsely serrate and often deeply lobed margins. *Inflorescence*: the flowers are small and densely compacted in narrow and woolly spikes about 2 to 25

cm. long. The upper-most spike is terminal while the two to many opposing lateral spikes are borne from the axils of the upper-most leaves. *COROLLA*: salverform with five-lobed and slightly bilabiate limbs, generally lavender, and about 2.5 to 5 mm. long. *FRUIT*: four nutlets about 1 to 2 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, primarily in open areas that are transitional between major habitat types, but generally uncommon. *DISTRIBUTION*: from Oregon to northern Baja California. ⊛May-Aug.

VIOLACEAE. VIOLET FAMILY.

A widely distributed family comprised of about 15 or 16 genera and 600 to 850 species of annual and perennial herbs, shrubs and trees.

VIOLA. VIOLET, PANSY.

A widely distributed but primarily temperate genus of about 450 species. The genus includes the various pansies and violets of ornamental horticulture.

1a. Leaves generally all cauline. All flowers well developed. Capsules glabrous and about 8 to 11 mm. long. . . . . ***V. pedunculata.***
1b. Basal leaves one to several. Cleistogamous (underdeveloped) flowers usually present. Capsules pubescent (when viewed with a hand-lens) and about 7 to 9 mm. long: . . . . . ***V. purpurea.***

Viola pedunculata Torrey & Gray [*V. p.* subsp. *tenuifolia* Baker & Clausen]. JOHNNY JUMP-UP, CALIFORNIA GOLDEN VIOLET (p. 181). *HABIT*: small perennial herbs with erect or ascending stems ranging from about 1 to 3 dm. (4-12") long. *LEAVES*: alternate and with petioles about 2 to 6 cm. long, the blades about 1 to 5.5 cm. long, broadly ovate to deltoid with an acute or obtuse apex, and with crenate or serrate margins. *INFLORESCENCE*: the flowers are produced singularly on axillary pedicels up to 15 cm. long. *COROLLA*: five asymmetrical and yellow to slightly orangish petals about 8 to 20 mm. long. The base of the lower petal is tinged reddish-brown and marked with dark lines, while the upper petals are tinged reddish-brown on the back side. *FRUIT*: a three-celled capsule about 8 to 11 mm. long. *OCCURRENCE*: known to occur in this region only in partly shady meadows dominated by *Quercus lobata* (Valley Oak) along the Marble Peak Trail, between Tassajara Camp and the Horse Bridge, where it is rather common. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Colusa and Sonoma Counties to northern Baja California, and the Sierra Nevada Foothills, from Fresno Co. to Tulare Co. *NOTE*: the plants of this region, with leaf blades mostly less than 2 cm. long, petals that are generally yellow, and with styles about 2 mm. long, correspond to what was recognized by Baker & Clausen as subsp. *tenuifolia*. ⊛March-May.

Viola purpurea Kellogg subsp. **quercetorum** (Baker & Clausen) Little [*V. q.* Baker & Clausen]. VIOLET OF THE OAKS. (p. 181). *HABIT*: small perennial herbs with erect or ascending stems ranging from about .5 to 1.5 dm. (2-6") tall. *LEAVES*: generally alternate and with petioles about 3 to 9 cm. long, the blades about 2 to 5 cm. long, mostly ovate with a cuneate to subcordate base, and with irregularly toothed margins. *INFLORESCENCE*: the flowers are produced singularly on axillary pedicels about 4 to 13 cm. long. *COROLLA*: five yellow and asymmetrical petals about 10 to 12 mm. long. The base of the lower petal is marked with fine purplish-brown lines, while the upper petals are tinged purplish-brown on the back side. *FRUIT*: a three-celled capsule about 7 to 8 mm. long. *OCCURRENCE*: widely scattered in generally open woodland habitats in the Tassajara region, and fairly common in some areas, such as the upper regions of Willow Creek and from the Church Creek area to Pine Valley. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from southwestern Oregon to San Diego Co. *NOTE*: plants at higher elevations in this region, such as on Chew's Ridge, on Pine Ridge and the vicinity of the Church Creek Divide, with the blades of some leaves having saliently toothed margins, have been assigned to *V. p.* subsp. *mohavensis* (Baker & Clausen) Clausen [*V. aurea* Kellogg subsp. *m.* Baker & Clausen] (Baker '53, Stebbins et. al. '63). ⊛March-June.

VISCACEAE (*Loranthaceae*). MISTLETOE FAMILY.

Eleven genera and about 450 species of shrubby and herbaceous plants, all of which are parasitic on trees or shrubs.

1a. Plants woody and parasitic on broadleaf trees (particularly oaks). Leaves present. . . . . ***Phoradendron.***
1b. Plants herbaceous and parasitic on pine trees. Leaves absent. . . . . ***Arceuthobium.***

ARCEUTHOBIUM. CONIFER MISTLETOE.

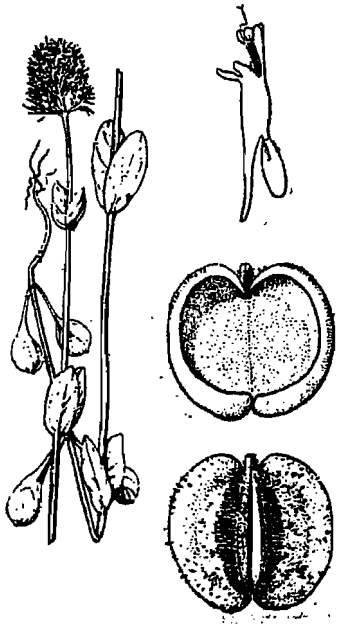
About 45 species of temperate and tropical regions of the Northern Hemisphere.

Arceuthobium occidentale Engelmann. FOOTHILL-PINE DWARF MISTLETOE, DIGGER-PINE MISTLETOE (p. 181). *HABIT*: small and rather inconspicuous perennial herbs that are parasitic on the stems of pines. The fragile and leafless stems, which are yellowish to brownish and about 6 to 12 cm. long, are comprised of jointed scale-like segments. *INFLORESCENCE*: the staminate flowers of male plants are produced in short spikes, while the pistillate flowers of female plants are produced in the axils of the stem segments. *FRUIT*: a roundish-compressed berry about 2 to 5 mm. wide. *OCCURRENCE*: widely scattered and locally common on *Pinus coulteri* at higher elevations of the Tassajara region, but apparently absent in populations at lower elevations, such as in The Pines. According to Griffin ('75), this species also occurs on *P. ponderosa* on Pine Ridge. *DISTRIBUTION*: Coast Ranges, Sierra Nevada and western Transverse Ranges, from Trinity and Shasta Counties to northern Los Angeles Co., and occurring mostly on *P. sabiniana* (Digger Pine). *NOTE*: the berry-like fruits rupture with great force when fully mature, discharging minute and sticky seeds which adhere to the needles of adjacent branches, thus setting the stage for a reproductive cycle that takes five or six years to complete. The fruits rupture in late summer or early autumn, and the seeds are washed down to the stems with the first rains. The seeds germinate in spring, and begin to penetrate the stems in summer. By the summer of the second year, infected stems begin to swell, and during the summer of the third year the first shoots appear. By the summer of the fourth year, staminate and pistillate plants can be distinguished. The flowers of pistillate plants may mature as early as the late summer of the fourth year, while those of staminate plants usually mature in the spring of the fifth year. The fruits take a year to mature.

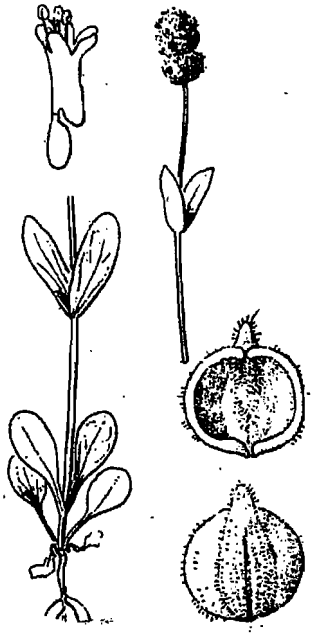
PHORADENDRON. MISTLETOE.

About 200 species of temperate and tropical North and South America.

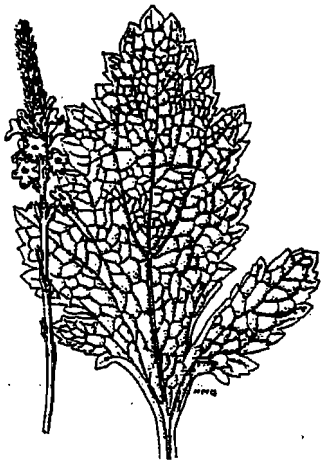
Phoradendron villosum (Nuttall) Nuttall [*P. flavescens* (Pursh) Nuttall var. *v.* (Nuttall) Engelmann]. OAK MISTLETOE, HAIRY MISTLETOE (p. 181). *HABIT*: woody-branched evergreen shrubs that are parasitic on the branches of broadleaf trees, primarily those of *Quercus* (oaks). *LEAVES*: opposite and short-petiolate, the blades rather thick and yellowish-green, roundish to narrowly-obovate with entire margins, and about 1.5 to 4 cm. long. *INFLORESCENCE*: both the staminate flowers of male plants and the pistillate flowers of female plants are produced in axillary spikes, with the flowers congested and somewhat sunken in the internodes. *FRUIT*: a white or pinkish berry about 3 to 4 mm. wide. *OCCURRENCE*: widely scattered in the Tassajara region, but uncommon and occurring mostly on *Q. chrysolepis* (Canyon Live Oak). *DISTRIBUTION*: western North America, from Oregon to Texas and northern Mexico. *NOTES*: this species is also reported to occur on *Platanus* (sycamore), *Populus* (cottonwood), *Salix* (willow), *Umbellularia* (California bay), and sometimes even on shrubs, such as *Arctostaphylos* (manzanita) and *Toxicodendron* (poison oak). Mistletoes seeds are spread from tree to tree mostly by the droppings of birds that have fed on the berries.



Plectritis ciliosa insignis



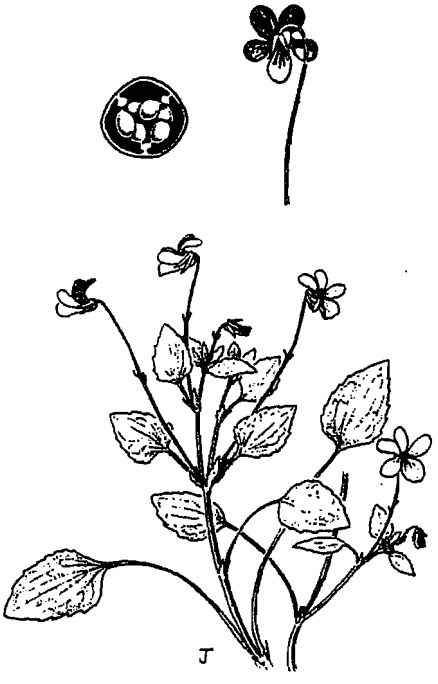
Plectritis macrocera



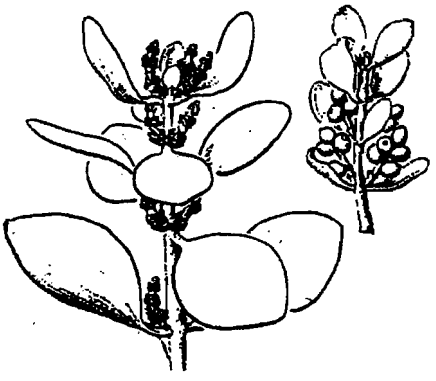
Verbena lasiostachys

Arceuthobium occidentale

Viola pedunculata



Viola purpurea quercetorum



Phoradendron villosum

ANTHOPHYTA. FLOWERING PLANTS.
Class MONOCOTYLEDONEAE. MONOCOTYLEDONS.

As enumerated by Thorne ('92), *Monocotyledoneae* is comprised of about 87 families, 3,541 genera and approximately 68,168 species, and thus represents about 29% of all species of flowering plants. Although *Monocotyledoneae* is well represented worldwide, especially by *Poaceae* (the Grass Family), the species are most diversified in tropical and subtropical regions.

1a. Perianth segments petal-like, i.e., colorful and/or delicately textured:
2a. Ovaries superior (positioned above the perianth segments and in no way joined to the segments). . . . . ***Liliaceae.***
2b. Ovaries inferior (positioned below or partially below the perianth segments):
3a. Perianth segments asymmetrical. Ovaries one-celled. Stamens one or two. . . . . ***Orchidaceae.***
3b. Perianth segments symmetrical. Ovaries three-celled. Stamens three. . . . . ***Iridaceae.***
1b. Perianth segments not petal-like:
4a. Flowers with three or more perianth segments:
5a. Flowers densely compacted on elongated spikes. Perianth segments are slender thread-like fibers. The fruit is an akene. Cat Tails. . . . ***Typhaceae.***
5b. Flowers borne on branching panicles. Perianth segments green when young and husk-like when mature, and arranged in two series of three's. The fruit is a many-seeded capsule. Rushes. . . . . ***Juncaceae.***
4b. Flowers with one or two perianth segments:
6a. Flowers with one scale-like perianth segment (bract) covering or partly covering the flowers and fruits. Stems solid, not jointed, and typically three-angled (and thus triangular) in cross section. Plants mostly of wet or moist habitats. Sedges. . . . . ***Cyperaceae.***
6b. Flowers with two husk-like perianth segments (glumes) subtending or sometimes enclosing the flowers and fruits. Stems hollow, solid only at the nodes (joints), and usually round in cross section. Most species not of wet or moist habitats. Grasses. . . . . ***Poaceae.***

CYPERACEAE. SEDGE FAMILY.

A large vascular plant family of worldwide distribution, comprised of more or less grass-like herbs that are most typically found in wet or moist habitats. The size of the family is uncertain, for estimates in botanical literature vary tremendously. For example, Cranfill in Hickman, ed. ('93), estimates the size at about 110 genera and 3,600 species, while Thorne ('92) estimates the size to be about 146 genera and 5,315 species.

1a. Spikelets closely adhering to the axis of the inflorescence. Flowers imperfect (with pollen producing stamens or fruit producing pistils, but never with both). Akenes enclosed in a perigynium (a womb-like structure). . . . . ***Carex.***
1b. Spikelets borne on the branches of spreading umbellate panicles. Flowers perfect. Akenes fully exposed:
2a. Spikelets two-ranked (akenes alternate on opposing sides of the axis), and are thus relatively flattened in cross-section. Main body of akenes of the local plants triangular in cross-section. . . . . ***Cyperus.***
2b. Spikelets imbricated (akenes layered in an upwardly spiraling pattern), and are thus relatively round in cross-section. Main body of akenes of the local plants elliptical in cross-section. . . . . ***Scirpus.***

CAREX. SEDGE.

With well over 1,000 species worldwide, the genus *Carex* ranks among the larger genera of vascular plants.

1a. Plants sometimes dioecious (the flowers staminate or pistillate, but never both). . . . . ***C. alma.***
1b. Plants monoecious (staminate flowers present in at least one spikelet):
2a. Main body of perigynia roundish or strongly three-lobed in cross-section. Culms extremely slender and wire-like and less than 6 dm. (2') tall. Plants mostly of shady woodland habitats (or only incidentally in riparian woodlands, and then usually away from the stream):
3a. Perigynia glabrous, main body strongly 3-lobed in cross-section. Spikelets produced singularly on each culm (pistillate below, staminate above, with the lower-most perigynium typically appearing to be separate from main body of spikelet). . . . . ***C. multicaulis.***
3b. Perigynia puberulent, main body round in cross-section. Spikelets one to seven on each culm, the terminal staminate, the lateral pistillate (or all spikelets pistillate on short basal culms). . . . . ***C. globosa.***
2b. Main body of perigynia plano-convex to flattened triangular in cross-section. Culms not markedly slender or wire-like, and at least the longer culms more to (usually) much more than 6 dm. tall. Plants mostly of wet or at least seasonally wet habitats (*C. senta* is occasionally found in shady woodland habitats):
4a. Terminal spikelet exclusively staminate and the lower spikelets exclusively pistillate, or staminate towards the apex and pistillate below. Staminate and pistillate spikelets or staminate or pistillate areas of androgynous spikelets are morphologically dissimilar and ready distinguishable:
5a. Perigynia flattened-triangular in cross-section. Stigmas three. Terminal spikelet narrowly linear, in sharp contrast to the short and broad lower spikelets, which are usually less than three times as long as wide. Lower spikelets exclusively pistillate. . . . . ***C. serratodens.***
5b. Perigynia plano-convex in cross-section. Stigmas two. Terminal spikelet not or not extremely narrower than the lower spikelets, which are usually much more than three times longer than wide. Most lower spikelets androgynous (staminate above, pistillate below):
6a. Staminate spikelets narrower than pistillate spikelets, flower scales semi-glossy purplish-black, perigynia readily evident. Perigynia readily deciduous after maturation. Plants forming large tufts in rocky beds or on rocky banks of major perennial streams, usually at or below mean water level (except in drought years), and never in any other habitat type. . . . . ***C. nudata.***

6b. Staminate and pistillate spikelets about the same width, flower scales dull rusty-brown, perigynia evident only when observed at close range. Perigynia mostly persistent after maturation. Plants typically forming dense rhizomatic colonies on shady streambanks, usually at or above mean water level, or occasionally as singular, tufted plants in shady woodland habitats. . . . . ***C. senta.***

4b. All spikelets androgynous, staminate flowers above or below the pistillate flowers. Staminate and pistillate areas of spikelets similar in appearance and are usually distinguishable only by close observation:

7a. Spikelets staminate at base and pistillate above. Perigynia scales green and smaller than the perigynia, thus the perigynia are readily apparent. . . . . ***C. bolanderi.***

7b. Spikelets staminate at the tip and pistillate below, or plants dioecious. Perigynia scales mostly straw-colored to brownish and slightly smaller to larger than the perigynia, thus the perigynia are largely obscured:

8a. Inflorescence mostly 3 to 15 cm. or sometimes up to 20 cm. long. Perigynia 3.5 to 4 mm. long and generally widest towards the base. Lower sheaths generally not cross-wrinkled in the front and not white-spotted on the back. . . . . ***C. alma.***

8b. Inflorescence mostly 1.5 to 5 cm. long, and not more than 6.5 cm. long. Perigynia 2 to 3.7 mm. long and generally widest in the middle. Lower sheaths generally cross-wrinkled in the front and white-spotted on the back. . . . . ***C. dudleyi.***

⇧**Carex alma** Bailey. STURDY SEDGE (p. 185). *HABIT*: tufted evergreen perennial herbs with culms ranging from about 3 to 12 dm. (1-4') tall. *BLADES*: narrow and often split along the mid-vein, about 1 to 5 dm. long and 2 to 6 mm. wide, and produced near the base of the culms. *SPIKES*: varying from densely contracted and head-like to elongate with the spikelets irregularly scattered along an axis up to 2 dm. long. The spikelets are androgynous in monoecious plants (staminate at the tip and pistillate below), or exclusively staminate or pistillate in dioecious plants. *PERIGYNIA*: ovate to oblong-ovate, plano convex, about 3.5 to 4 mm. long, and obscured by straw-colored to brownish scales with hyaline-margins. *OCCURRENCE*: locally common along perennial or mostly perennial streams in the Tassajara region, particularly in sunny places along smaller streams. *DISTRIBUTION*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Monterey and Fresno Counties to northern Baja California, and eastward, along streams and in desert oases,' to Nevada and Arizona. ⊛May-July.

Carex bolanderi Olney [*C. deweyana* Schwein var. *bolanderi* W. Boott] (p. 185). *HABIT*: somewhat loosely tufted evergreen perennial herbs with slender culms ranging from about 2 to 8 dm. (8-32") tall. *BLADES*: fairly lax and grass-like, about 2 to 5 dm. long and 2 to 5 mm. wide, and numbering about three to five on the lower quarter of each culm. *SPIKES*: about 3 to 8 cm. long and comprised of about 5 to 8 spikelets. The spikelets are about 6 to 25 mm. long, mostly pistillate, and usually have fewer than 20 perigynia. *PERIGYNIA*: narrowly lanceolate to oblanceolate with a cleft beak, and ranging from about 3 to 4.5 mm. long. *OCCURRENCE*: common along perennial streams in the Tassajara region, and occasionally at springs or seeps. *DISTRIBUTION*: widespread in the mountains of western North America, from British Columbia to southern California and New Mexico. In California the species ranges southward to the Santa Lucia Mts. of San Luis Obispo Co. in the Coast Ranges, and through the Sierra Nevada, with additional populations in the San Gabriel and San Bernardino Mts. ⊛ April-June.

Carex dudleyi Mackenzie (not Bailey) (p. 185). *HABIT*: tufted perennial herbs with slender culms ranging from about 3 to 7 dm. (12-28") tall. *BLADES*: about 1 to 3 dm. long and 4 to 7 mm. wide, and produced on the lower quarter of the culms. *SPIKES*: ovate to oblong in outline, about 1.5 to 6.5 cm. long, and with up to ten or more small and androgynous spikelets. *PERIGYNIA*: narrowly rhombic to lance-ovate, about 2 to 4 mm. long, and generally plano-convex with winged and upwardly serrulate margins. The perigynia scales are commonly terminated by a conspicuous awn. *OCCURRENCE*: although I was not able to locate this species in the Tassajara region, Tassajara Hot Springs is the type locality. The type specimen was collected by A. D. E. Elmer in June of 1901 (Elmer #3132 DS), and although it is probable that the specimen contains an envelope enclosing a note stating the exact location of collection, the type specimen was on loan at the time of my research at the California Academy of Sciences/Dudley Herbarium in San Francisco. The species should be looked for in wet or seasonally wet habitats in this region. *DISTRIBUTION*: Coast Ranges, from southwestern Oregon to San Luis Obispo County, and southward through the Sierra Nevada to at least Fresno County. Also reported from the Modoc Plateau, Central Valley, Western Transverse Ranges, and the mountains of the California deserts. ⊛May-July.

Carex globosa Boott. REDWOOD SEDGE, ROUND-FRUITED SEDGE (p. 185). *HABIT*: small and loosely tufted perennial herbs with very slender (wire-like) culms ranging from about 1.5 to 4 dm. (6-16") tall. *BLADES*: slender, about .3 to 3 dm. long and 1.5 to 2 mm. wide, and averaging about five to eight per culm. *SPIKES*: staminate flowers are produced in slender spikelets (7-20 mm. X 2.5-4 mm.) that terminate the longer culms, while pistillate flowers are produced in one to three shorter but broader spikelets (5-10 mm. X 4-8 mm.) that closely subtend the staminate spikelet. Pistillate spikelets are also produced on short basal culms. *PERIGYNIA*: about 4 to 5 mm. long, with the main body distinctly roundish in cross-section. *OCCURRENCE*: widely scattered in shady woodland habitats of the Tassajara region, and locally common, such as in Pine Valley. *DISTRIBUTION*: outer Coast Ranges and coastal southern California, from Humboldt Co. to San Diego Co., and particularly common in and around red-wood forests. ⊛May-July.

⇳**Carex multicaulis** Bailey. WOODLAND SEDGE, MANY-STEMMED SEDGE (p. 186). *HABIT*: loosely to moderately densely tufted grass-like perennial herbs with many very slender (wire-like) culms ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: up to 3 dm. long and about 1 to 1.5 mm. wide, and produced near the base of the culms (the upper-most blades are short bract-like structures subtending the inflorescence). *SPIKES*: comprised of only one androgynous spikelet containing one to six perigynia, with the lowest perigynium (and sometimes the only perigynium) often appearing to be somewhat removed from the main body of the spikelet. *PERIGYNIA*: about 5 to 7 mm. long, with the main body distinctively three-lobed in cross-section. *OCCURRENCE*: widely scattered in shady woodland habitats in the Tassajara region, and locally common in suitable habitats at higher elevations. Plants are also occasionally found in the shade of tall and *Ceanothus*-dominated chaparral, and sometimes in riparian woodlands, but away from the immediate banks of streams. *DISTRIBUTION*: from Oregon southward, to Lake Co. in the north Coast Ranges, and through the Sierra Nevada, to the Transverse and Peninsular Ranges of southern California, with a disjunct population in the Santa Lucia Mts. ⊛May-July.

Carex nudata Boott. TORRENT SEDGE (p. 186). *HABIT*: very densely cespitose sedges often forming tufts up to 9 dm. (3') wide in rocky streambeds. The numerous culms, which are at first erect but tend to arc downward as the spikelets reach maturity, are about 3 to 8 dm. (12-32") long. *BLADES*: basal leaves, which are usually split along the mid-vein, are shorter to about as long as the culms, while the two to four leaves of the culms have blades about 1 to 2.5 dm. (4-10") long. *SPIKES*: comprised of four or five spikelets. The terminal spikelet is staminate and about 1.5 to 3.5 cm. long, while the two or three lateral spikelets are pistillate or pistillate below and staminate towards the apex, and about 1 to 4 cm. long. The semi-glossy flower-scales are quite distinctive, for they are purplish-black with straw-colored mid-

ribs, and create a rather vivid contrast of shade in the pistillate spikelets, for the scales only partially obscure the light straw-colored perigynia. *PERIGYNIA*: oblong to obovate, plano-convex, and about 2.5 to 4 mm. long. *OCCURRENCE*: common in the beds of larger streams in this region, such as Tassajara Creek, and apparently ecologically dependent on rock-bedded streams that are regularly subjected to swift and massive water flows, for it is nearly to totally absent along smaller perennial streams. *DISTRIBUTION*: Coast Ranges, from northwestern Oregon to the western Transverse Ranges of Santa Barbara Co., and the Sierra Nevada, from Plumas Co. to Mariposa Co. *NOTE*: the large tufts produced by this species, which commonly form small stream-bed islands, create one of the most aesthetically appealing characteristics of the larger streams of this region. ⊛April-May.

Carex senta Boott. BANK SEDGE, ROUGH-LEAFED SEDGE (p. 186). *HABIT*: moderately to densely cespitose sedges with culms ranging from about 3 to 10 dm. (12-40") tall, and often forming dense colonies via horizontal stolons. *BLADES*: about 4 to 8 on the lower half of the culms, and ranging from about 1 to 4 dm. long and 3 to 5 mm. wide. *SPIKES*: comprised of about three to five elongated rusty-brown spikelets about 3 to 5 cm. long, which tend to persist on the culms well after maturation. The terminal and often the uppermost lateral spikelets are staminate, the lowermost pistillate, while the central spikelets are often pistillate below and staminate above. *PERIGYNIA*: broadly ovate to obovate or nearly round, slightly plano-convex, abruptly short-beaked, and about 3 to 3.5 mm. long. *OCCURRENCE*: common on shady streambanks and other moist habitats at lower to intermediate elevations of the Tassajara region, and forming dense colonies in some areas, such as along the streamside trail about half way between the hot springs and The Narrows. Occasionally plants are found on shady woodland slopes, well away from water. *DISTRIBUTION*: Coast Ranges, from Solano Co. southward, and the Sierra evada, from Butte Co. southward, to northern Baja California. Also in Arizona. ⊛May-July.

Carex serratodens Boott [*C. bifida* Boott]. BIFID SEDGE (p. 186). *HABIT*: rather loosely cespitose sedges with culms ranging from about 3 to 12 dm. (1-4') tall. *BLADES*: well developed blades are two to five on the lower quarter of the culms, and range from about 1 to 6 dm. long and about 1.5 to 4 mm. wide. *SPIKES*: comprised of about three to five spikelets, the terminal spikelet narrowly linear, staminate, and about 15 to 30 mm. long, while the two to four lateral spikelets are short and swollen, pistillate, and about 6 to 18 mm. long. *PERIGYNIA*: ovate to oblong-ovate, triangular in cross section, and about 3 to 5 mm. long. *OCCURRENCE*: widely scattered and locally common along perennial streams in the Tassajara region, and sometimes at springs and seeps. *DISTRIBUTION*: Coast Ranges, western Transverse Ranges and the Tehachapi Mts., from Oregon to Ventura and Kern Counties. Also in the Sierra Nevada, from Butte to Tuolumne Counties, but uncommon. ⊛May-June.

Carex subfuca Boott. RUSTY SEDGE (p. 187). *HABIT*: tufted evergreen perennial herbs with culms ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: mostly about 5 to 20 cm. long and 1.2 to 3.7 mm. wide, and produced mostly on the lower third of the culms. *SPIKES*: small and head-like, usually less than 3 cm. long and with spikelets less than 1 cm. long, the spikelets crowded together or the lower one or two positioned a short distance below the upper spikelets. The spikelets are staminate below and pistillate above. *PERIGYNIA*: narrowly to broadly ovate, plano-convex, and about 2.5 to 4 mm. long. *OCCURRENCE*: scattered in wet or moist habitats in Pine Valley, on Chew's Ridge, in Strawberry Valley, and probably in Miller's Canyon, but not known to occur elsewhere in this region. *DISTRIBUTION*: widely distributed in mountains of western North America, mostly from about 1,000 to 11,500 ft., from British Columbia to northern Baja California. ⊛May-July.

CYPERUS. UMBRELLA SEDGE, NUTSEDGE, GALINGALE.

Approximately 600 species of tropical, subtropical and temperate regions.

Cyperus eragrostis Lamarck. TALL UMBRELLA SEDGE (p. 187). *HABIT*: rhizomatic perennial herbs with culms ranging from 2 to 9 dm. (8-36") tall. *BLADES*: linear and grass-like, the primary basal and ranging from about a fourth to about as long as the culms, the upper (subtending the inflorescence) whorled in five's to eight's, unequal in length, with the largest up to 5 dm. long. *INFLORESCENCE*: an umbel-like panicle (the branches radiating from a common point), with the spikelets irregularly clustered at the ends of the branches. *FRUIT*: semi-glossy akenes about 1 mm. long. The akenes are obovate in outline and triangular in cross-section, with dark and truncated bases and short linear tips. *OCCURRENCE*: scattered along the larger perennial streams of the Tassajara region, mostly below about 2,000 ft. elevation, and locally common in rhizomatic colonies in areas that are generally protected from major torrents, such as on the upstream side of bends in streams. *DISTRIBUTION*: along streams, on the banks of lakes, in marshes, etc., from southern Oregon to northwestern Baja California. Also native to central Chile. ⊛May-November.

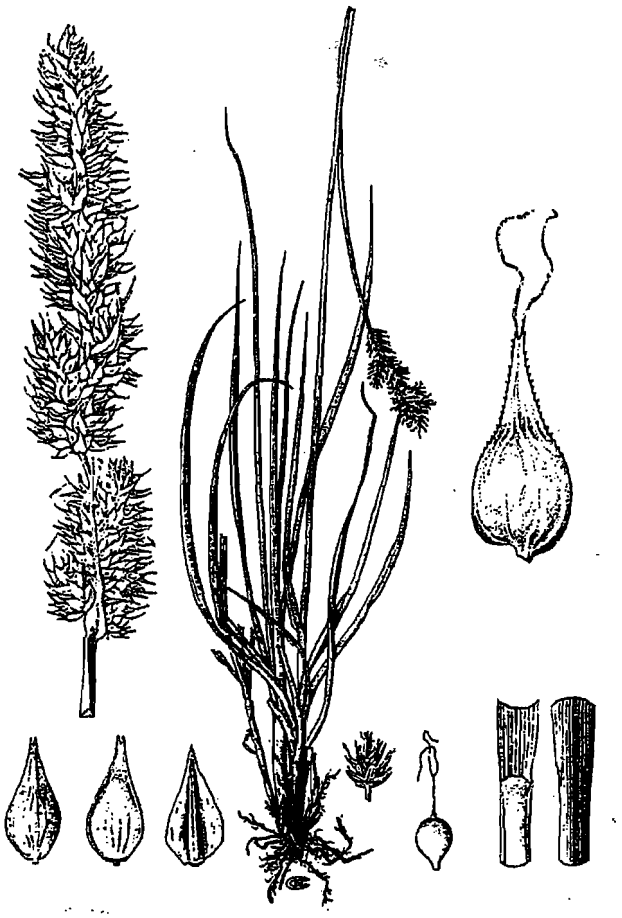
SCIRPUS. BULLRUSH.

A nearly worldwide genus of about 200 species: most of the species are restricted to wet habitats.

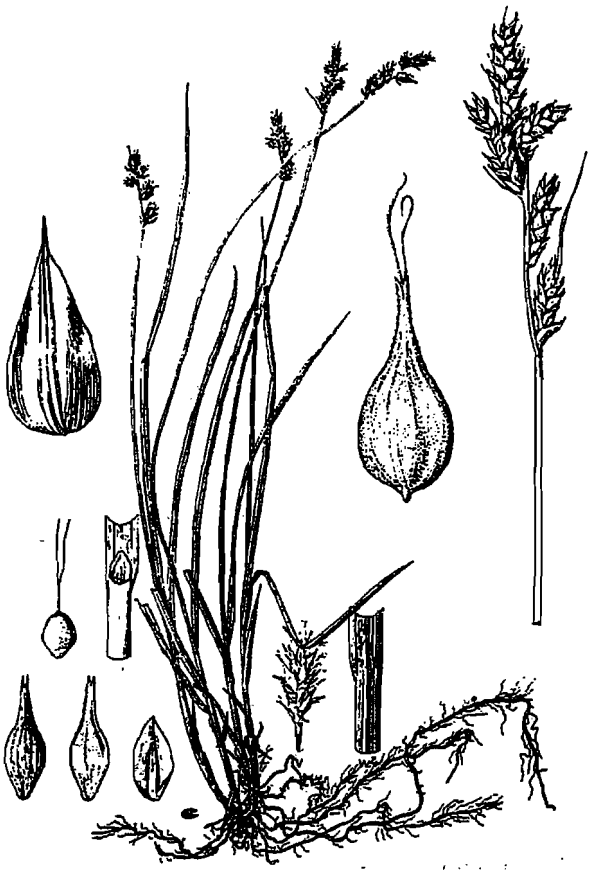
Scirpus microcarpus Presl. SMALL-FRUITED BULLRUSH (p. 187). *HABIT*: stoutly rhizomatic perennial herbs with culms ranging from about 6 to 16 dm. (2-5') tall. *BLADES*: the basal and cauline are up to 60 cm. long and about 1 to 2 cm. wide, while those subtending the inflorescence are in whorls (of up to five leaves) and about 2 to 20 cm. long and .3 to 1 cm. wide. *INFLORESCENCE*: open and freely branched compound umbels, the primary branches ranging from about 3 to 15 cm. long. The small and imbricated spikelets, which are about 2 to 8 mm. long, are clustered at the ends of the secondary branches. *FRUIT*: lenticular and straw-colored akenes about 1 mm. wide. *OCCURRENCE*: widely scattered along perennial streams and in other wet habitats in the Tassajara region. At lower elevations it is often found in association with the similar looking *Cyperus eragrostis*. *DISTRIBUTION*: widely distributed in temperate North America and Asia. ⊛May-August.

Note on *Cyperaceae*.

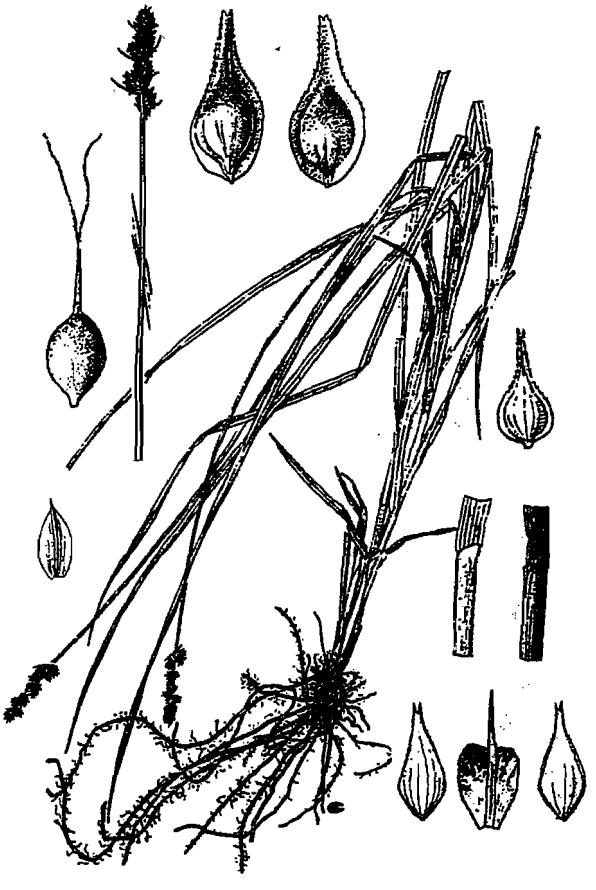
Cyperaceae species that have been reported to occur in areas of the Santa Lucia Mts. near or relatively near the Tassajara region include: *Carex barbarae*, *Carex deweyana* subsp. *leptopoda*, *Cyperus erythrorhizos*, *Eleocharis macrostachya*, *Scirpus acutus*, *Scirpus cernus* and *Scirpus robustus*.



Carex alma

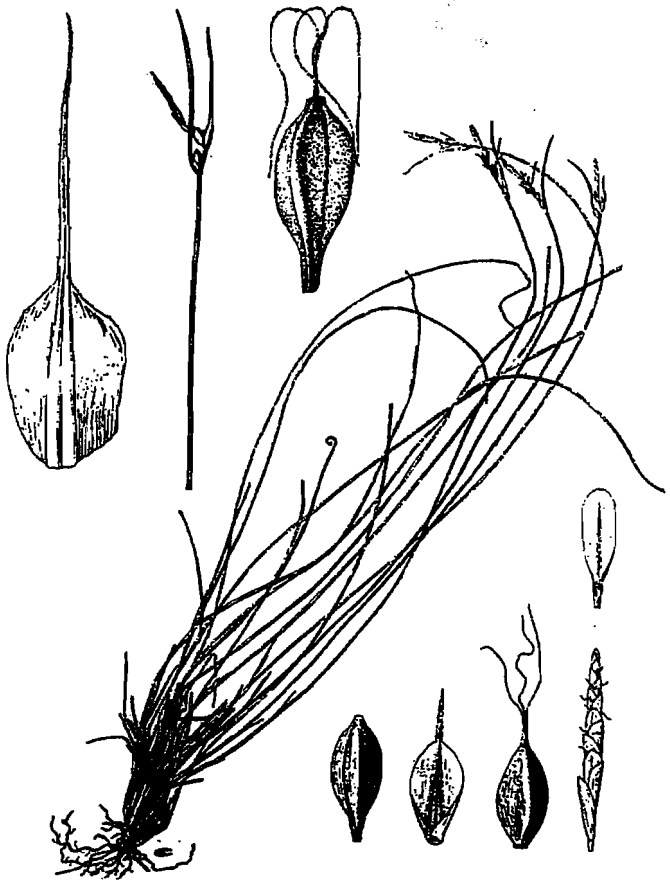


Carex bolanderii



Carex dudleyi

Carex globsa



Carex multicaulis

Carex nudata

Carex senta

Carex serratodens

Carex subfusca

Cyperus eragrostis

Scirpus microcarpus

IRIDACEAE. IRIS FAMILY.

About 80 genera and 1,500 species of perennial herbs of tropical and temperate regions. The family is the source of many fine ornamentals, and the flowers of *Crocus sativus* (saffron) have for many centuries been used as both a colorful food seasoning and as a fabric dye.

SISYRINCHIUM.

About 70 species of the Western Hemisphere.

Sisyrinchium bellum Watson. CALIFORNIA BLUE-EYED GRASS, NIGGER BABIES (p. 189). *HABIT*: tufted perennial herbs with flowering stems ranging from about 1 to 5 dm. (4-20") tall. *LEAVES*: primary leaves are generally grass-like and produced at or near the base of the plant, while upper (cauline) leaves are reduced in size and often bract-like. *INFLORESCENCE*: flowers are produced in umbel-like clusters that are subtended by two-bracted spathes. *PERIANTH*: comprised of six equal or nearly equal and generally oblong to obovate segments that are dark blue or purple-blue, about 12 to 15 mm. long, and terminated by a short point. *FRUIT*: a globose and pale to dark-brown capsule about 2 to 7 mm. long. *OCCURRENCE*: scattered along the Arroyo Seco River in the vicinity of the confluence of Tassajara Creek, but not seen elsewhere in this region. The plants are probably the offspring of plants growing somewhere upstream. *DISTRIBUTION*: widespread and locally common in California and adjacent Oregon. ⊛March-May.

JUNCACEAE. RUSH FAMILY.

Eight or nine genera and about 300 to 325 species primarily of cooler-temperate and subarctic regions.

1a. Plants of wet or seasonally wet habitats. Leaf-blades, if present, round in cross-section. Sheaths split. Stems filled with a pithy substance. ***Juncus***.

1b. Plants shady or semi-shady woodland slopes. Leaf-blades fairly lax and flat or "V" shaped in cross-section. Sheaths not split. Stems hollow. . . . . ***Luzula***.

JUNCUS. RUSH.

Approximately 225 species worldwide, but primarily of the Northern Hemisphere.

1a. Annual herbs less than 3 dm. tall. . . . . ***J. bufonius***.

1b. Evergreen perennial herbs mostly about 4 to 13 dm. tall:

2a. Leaf-like bract subtending the panicle short and inconspicuous. Cauline leaves with well developed blades. Stems roughened by minute transverse ridges. . . . . ***J. rugulosus***.

2b. Leaf-like bract subtending the panicle very conspicuous and continuing well beyond the panicle. Blades absent or small rudiments. Stems not roughened:

3a. Stamens 6. Capsules rounded at the apex. . . . . ***J. patens***.

3b. Stamens 3. Capsules three-lobed at the apex. . . . . ***J. effusus***.

Juncus bufonius Linnaeus. TOAD RUSH (p. 189). *HABIT*: tufted annual herbs with slender stems ranging from about 3 to 30 cm. tall. *LEAVES*: one to three per stem, short, flat or involute, and less than 1.5 mm. wide. *INFLORESCENCE*: flowers are singular or in small groups and scattered in cymose panicles which occupy much of the upper half of the plants. *PERIANTH*: divided into six light green segments about 3 to 6 mm. long. *FRUIT*: an oblong to obovoid capsule which is shorter than the perianth segments. *OCCURRENCE*: common in open and seasonally wet habitats Pine Valley, mostly north of Pine Valley Camp, and, according to Griffin ('75), occasionally in seasonally wet habitats on Chew's Ridge. *DISTRIBUTION*: nearly worldwide except for polar and tropical regions. ⊛April-July (-Sept.).

Juncus effusus Linnaeus var. **pacificus** Fernald & Wiegand. COMMON RUSH (p. 189). *HABIT*: densely tufted evergreen perennial herbs from stout branching rhizomes, with erect stems ranging from about 6 to 12 dm. (2-4') tall. *LEAVES*: brown sheaths that are mostly without blades, except for an occasional rudiment. *INFLORESCENCE*: branching terminal panicles which appear to the sidereal due to an erect subtending bract that strongly resembles a continuation of the stem. *PERIANTH*: divided into six pale greenish-brown segments about 2.5 to 3.5 cm. long. *FRUIT*: an obovoid capsule that is about as long as the perianth segments. *OCCURRENCE*: widely scattered in wet or seasonally wet habitats in the Tassajara region, but generally uncommon. *DISTRIBUTION*: British Columbia to northern Baja California. The typical species is widely distributed in the northern temperate regions of North America and Eurasia. ⊛June-Aug.

Juncus patens Meyer. SPREADING RUSH (p. 189). *HABIT*: densely tufted evergreen perennial herbs from stout rhizomes, with erect stems ranging from about 4 to 8 dm. (16-32") tall. *LEAVES*: brown sheaths that are mostly without blades, except for an occasional rudiment. *INFLORESCENCE*: branching terminal panicles which appear to the sidereal due to an erect subtending bract that strongly resembles a continuation of the stem. *PERIANTH*: divided into six generally lanceolate segments about 2.5 to 3 mm. long. The segments are light brown with a green midrib. *FRUIT*: a subglobose capsule about as long or slightly shorter than the perianth segments. *OCCURRENCE*: perhaps the most common rush species in the Tassajara region, and fairly regularly encountered in seasonally or perennially wet habitats. *DISTRIBUTION*: Coast Ranges and western Transverse Ranges, from Oregon to Santa Barbara Co. and the Channel Islands. ⊛June-July.

⇧**Juncus rugulosus** Englemann. WRINKLED-STEMMED RUSH (p. 189). *HABIT*: evergreen perennial herbs from stout rhizomes, with erect and relatively stout stems ranging from about 4 to 10 dm. (16-40") tall. *LEAVES*: basal leaves are without blades, while cauline leaves have narrowly linear blades about 1 to 4 dm. long; the blades are round in cross section and generally hollow. *INFLORESCENCE*: diffuse compound panicles with the flowers produced in clusters of four to eight. *PERIANTH*: divided into six generally narrowly lanceolate and light greenish brown to brown segments about 2.5 to 3 mm. long. *FRUIT*: narrowly oblong capsules which are generally longer that the perianth segments. *OCCURRENCE*: widely scattered but only occasional along streams or in other moist or seasonally moist habitats in the Tassajara region. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Monterey Co. to San Diego Co. *NOTE*: this species can be easily identified by touch, for the stems quite evidently roughened by minute transverse ridges. ⊛July-Sept.

LUZULA. WOOD-RUSH.

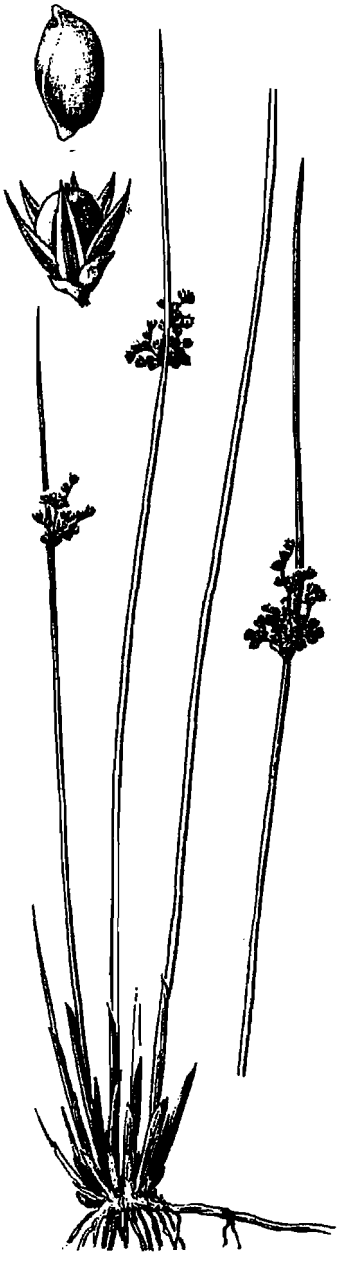
A nearly worldwide but mostly northern hemispheric genus of about 80 species of grass-like perennial herbs.

Luzula comosa Meyer [*L. subsessilis* (Watson) Buchenau] (p. 189). *HABIT*: fairly inconspicuous and grass-like herbs with culms ranging from about 1 to 3 dm. (4-12") tall. The plants are perennial, but die back to the root during the dry season. *LEAVES*: primarily basal, the blades about 5 to 15 cm. long and 3 to 7 mm. wide, and with generally wavy cilia on the margins. *INFLORESCENCE*: generally umbellate with the flowers produced in head-like clusters on rays about .5 to 5 cm. long. *PERIANTH*: divided into six segments about 2 to 5 mm. long. The segments are generally brown or brownish with broad translucent margins. *FRUIT*: a roundish capsule which is shorter to about as long as the perianth segments. *OCCURRENCE*: apparently widely scattered on semi-shady and grassy woodland slopes in the Tassajara region, but uncommon. I have seen this species in suitable habitats in the lower Tassajara Creek and Willow Creek areas, in the vicinity of the hot springs, at the Church Creek Divide, and in Pine Valley. *DISTRIBUTION*: from Alaska southward, through the Coast Ranges and the Sierra Nevada, to the San Gabriel, San Bernardino and San Jacinto Mountains of southern California and the Channel Islands. Also in the Rocky Mountains. ⊛March-May.

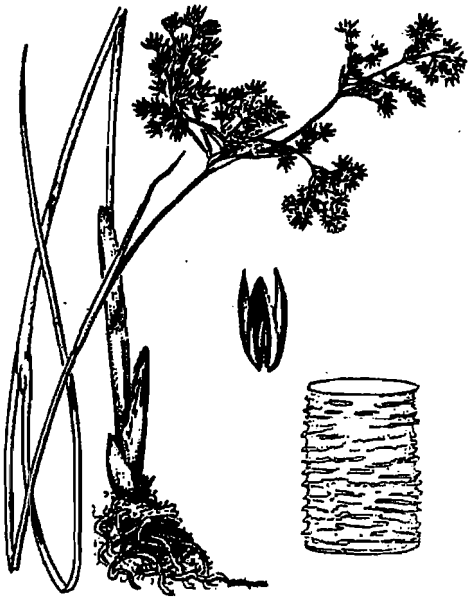
Sisyrinchium bellum

Juncus bufonius

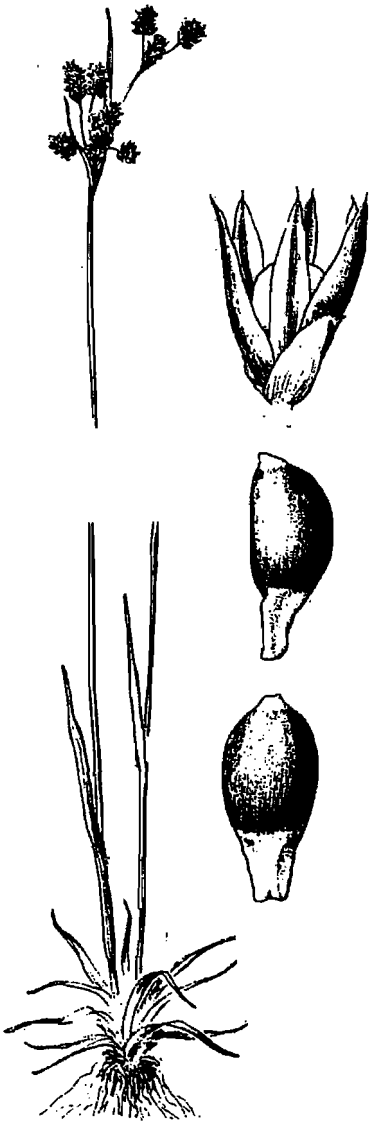
Juncus effusus



Juncus patens



Juncus rugulosus



Luzula comosa

LILIACEAE. LILY FAMILY.

A highly diverse family comprised of about 300 genera and 4,600 species. The family is mostly comprised of bulbous perennial herbs, but also includes rhizomatic creepers and shrub or tree-like species (such as the Joshua Tree, *Yucca brevifolia*).

1a. Leaves stiff and sword-like, up to 1 m. (40") long, tapering to a very sharp and penetrating spine, and produced in dense basal tufts. Flowers borne in profusion in massive panicles on thick stalks up to 4 m. (13') tall. . . . . ***Yucca***.
1b. Plants not similar to the above:
2a. Flowers produced in terminal umbellate clusters, the flowers clearly radiating from a common point:
3a. Perianth segments (petals) divided to or nearly to the base:
4a. Perianth segments yellow. Pedicels jointed. Filaments with cup-shaped winged appendages at base. Plants not smelling or tasting onion-like. . . . . ***Bloomeria***.
4b. Perianth segments not yellow. Pedicels not jointed. Filaments without appendages. Plants with an onion-like scent and taste. . . ***Allium***.
3b. Perianth segments united for at least ¼ of the length of the perianth:
5a. Perianth segments creamy yellow. . . . . ***Triteleia***.
5b. Perianth segments dark to pale blue or purple:
6a. Umbels dense and head-like, the pedicels .2 to 1.5 cm. long. Filaments forming a crown-like tube outside anthers. . . ***Dichelostemma***.
6b. Umbels open, the pedicels 1 to 4 cm. long. Staminodes three and unlike and alternate fertile stamens. . . . . ***Brodiaea***.
2b. Flowers not produced in umbellate clusters, or if the inflorescence is somewhat umbellate, then the flower do not radiate from a common point:
7a. Styles three and distinct to the base. . . . . ***Zigadenus***.
7b. Styles singular (but often 3-lobed or parted at the apex):
8a. Well developed borne only at or near the base of the plant, upper "leaves" reduced to scarious bracts. . . . . ***Chlorogalum***.
8b. Well developed leaves present on the stems above the base of the plant, but may be reduced in size or modified in shape and/or arrangement:
9a. Stems rising from creeping root-stalks. Perianth 4 to 15 mm. long. The fruit is a moist berry:
10a. Flowers produced in many-flowered racemes. . . . . ***Smilacina***.
10b. Flowers solitary or in small clusters. . . . . ***Disporum***.
9b. Stems rising from bulbs. Perianth 15 to 50 mm. long. The fruit is a dry capsule:
11a. All leaves alternate. Inner perianth segments larger than the outer segments. . . . . ***Calochortus***.
11b. At least some leaves whorled, except in *Fritillaria falcata*. Inner and outer perianth segments about the same size:
12a. Perianth segments reflexed backward. Plants of wet habitats. . . . . ***Lilium***.
12b. Perianth segments not reflexed backward. Plants of dry or mostly dry habitats. . . . . ***Fritillaria***.

ALLIUM. ONION, GARLIC, LEEK.

About 500 species of northern temperate regions.

1a. Scapes (flowering stems) 1 to 3 dm (4-12") tall. Leaves two to three. Perianth segments pale rose. . . . . *A. **campanulatum***.
1b. Scapes less than 1 dm. (4") tall. Leaves singular. Perianth segments pinkish-purple with dark midveins. . . . . *A. **burlewii***.

⇧**Allium burlewii** Davidson (p. 194). *HABIT*: small bulbous perennial herbs with scapes ranging from about 2 to 8 cm. (.75-3") tall. *LEAVES*: singular and basal, and generally longer than the scapes. *INFLORESCENCE*: terminal umbels comprised of about 8 to 20 flowers on pedicels about 6 to 10 mm. long. *PERIANTH*: divided into six narrowly ovate to oblong-lanceolate and erect segments about 7 to 10 mm. long; the segments are pinkish-purple with dark midveins. *FRUIT*: a small roundish to slightly oval capsule about 4 mm. long. *OCCURRENCE*: the only site in this region where this species is known to occur is in granitic sand on the northeasterly side of massive boulders on the crest of Black Butte, were it was discovered by Vern Yadon in 1979. The only other site in the Santa Lucia Mts. that I am aware of is on Cone Peak, where it was discovered by Steven Talley in 1972 (Griffin '75). *DISTRIBUTION*: from Kern Co. in the southern Sierra Nevada, and the Sierra Madre in the Transverse Ranges of Santa Barbara Co., to the San Bernardino Mts. of San Bernardino Co. and the San Jacinto Mts. of western Riverside Co., mostly between 6,000 to 9,000 ft., and below 6,000 ft. on San Benito Mt. in San Benito Co. and the Santa Lucia Mts. of Monterey Co. ⊛April-June.

⇧**Allium campanulatum** Watson. SIERRA ONION (p. 194). *HABIT*: small bulbous perennial herbs with one or two scapes ranging from about 1 to 3 dm. (4-12") tall. *LEAVES*: two or three linear blades which are produced near the base of the scapes. *INFLORESCENCE*: the flowers are borne in terminal umbellate clusters on pedicels about 1 to 2 cm. long. *PERIANTH*: divided into six lanceolate to ovate and pale rose segments about 7 to 10 mm. long (inclusive of the very slender and somewhat awn-like tip). *FRUIT*: a small and roundish capsule about 3 mm. long. *OCCURRENCE*: scattered on serpentine plugs and occasionally on granitic talus slopes in mixed evergreen forests along the Pine Ridge Trail from near the Church Creek Divide to Pine Ridge. Also on serpentine plugs on Chew's Ridge. *DISTRIBUTION*: north Coast Ranges, from southern Oregon to Lake Co., and through the Sierra Nevada, to the higher elevations of the Transverse and Peninsular Ranges of southern California (to San Diego Co.), with a disjunct population scattered on the higher ridges of the Santa Lucia Mts. of Monterey Co. The species occurs mostly in coniferous forests between 2000 to 6000 ft. in northern California and Oregon, and from 6000 to 9000 ft. in southern California. ⊛May-July.

BLOOMERIA. GOLDEN STARS.

Two species of the California Floristic Province.

⇧**Bloomeria crocea** (Torrey) Coville [*B. c.* var. *aurea* (Kellogg) Ingram] (p. 194). *HABIT*: bulbous perennial herbs with scapes ranging from about 2 to 8 dm. (8-32") tall. *LEAVES*: basal and usually singular, grass-like, and up to 4 dm. long. *INFLORESCENCE*: the flowers are borne in open terminal umbels on pedicels about 2 to 6 cm. long. *PERIANTH*: divided nearly to the base into six dark yellow or orangish-yellow segments

about 8 to 12 mm. long, the midribs brownish on the external surface. *FRUIT*: a three-angled capsule about 5 to 6 mm. long. *OCCURRENCE*: widely scattered and locally common in clay-loamed soils along the Church Creek Fault, which both the Horse Pasture and Church Creek Trails follow. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Monterey and San Benito Counties to northern Baja California. *NOTE*: this species is frequently found in association with the similar-looking *Triteleia ixioides*, but can be easily distinguished by the perianth segments being divided nearly to the base. ⊛May-July.

BRODIAEA.

Fourteen species of the Pacific Slope of temperate western North America. All of the species occur in California, and 13 are endemic to the California Floristic Province.

⇧**Brodiaea jolonensis** Eastwood. JOLON BRODIAEA (p. 194). *HABIT*: bulbous perennial herbs with scapes ranging from about .5 to 1.5 dm. (2-6") tall. *LEAVES*: grass-like and usually longer than the scapes. *INFLORESCENCE*: flowers are produced in open terminal umbels on pedicels about 1 to 4 cm. long. *PERIANTH*: tube and segments violet, the tube 7 to 9 mm. long, the segments lance-ovate and about 11 to 18 mm. long, the inner three about 2 mm. wider than the inner three. *FRUIT*: an ovoid capsule about 5 to 6 mm. long. *OCCURRENCE*: this entry is based on A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3218 DS). According to a note enclosed in an envelope pasted to the specimen sheet, Elmer collected it in "Pine Valley, near open meadow." I was not able to find this species in Pine Valley (or anywhere else in this region). If plants are still extant in Pine Valley, they not only represent one of the most northern populations, but also perhaps the highest elevation population (the species is usually found below 1,000 ft.). *DISTRIBUTION*: Coast Ranges, from Monterey Co. southward, to coastal southern California and northwestern Baja California. Also on Santa Cruz and Santa Catalina Islands. ⊛April-May.

CALOCHORTUS. MARIPOSA LILY, GLOBE LILY, STAR TULIP.

About 65 species of western North America and Central America.

1a. Flowers generally facing downward or at a downward angle, the inner perianth segments (petals) converging at the apex, thus the flowers are globe-like in shape. Perianth segments white to red or reddish. . . . . ***C. albus***.

1b. Flowers facing upward or at an upward angle, the inner perianth segments ascending, thus the flowers are bowl or bell-like in shape. Perianth segments white to bluish, purplish or lilac:

3a. Glands of inner perianth segments not or just slightly depressed, not surrounded by a membrane, but usually covered by long fungus-like hairs. . . . . ***C. splendens***.

3b. Glands of inner perianth segments depressed, surrounded by a membrane, and with only short and sparse hairs. . . . . ***C. invenustus***.

Calochortus albus Douglas ex Benthham **var. rubellus** Greene. FAIRY LANTERNS, GLOBE LILY, SNOW DROPS, INDIAN BELLS, SATIN BELLS (p. 194). *HABIT*: bulbous perennial herbs with erect or ascending and usually upwardly branching stems ranging from about 2 to 8 dm. (8-32") tall. *LEAVES*: linear to linear-lanceolate, the singular basal leaf, which arises from the bulb before the stem, is about 3 to 7 dm. long and 1 to 5 cm. wide, while the smaller cauline leaves diminish in size upward on the stem. *INFLORESCENCE*: flowers are produced singularly in the axils of bract-like upper leaves and usually coupled at the apex of the branches, and are generally turned downward on pedicels about 1 to 4 cm. long. *PERIANTH*: globose, the outer segments ovate and about 10 to 15 mm. long, the inner segments broadly elliptic, about 20 to 25 mm. long, and converging at the apex. The segments are pink-tinged and red-streaked, and the glands of the inner segments resemble blood-blisters. *FRUIT*: a three-winged elliptic-oblong capsule about 25 to 40 mm. long. *OCCURRENCE*: widely scattered and locally common in shady or partly shady habitats in the Tassajara region, mostly in woodlands but sometimes in chaparral. *DISTRIBUTION*: Coast Ranges, from the San Francisco Bay Area to Santa Barbara Co., and Sierra Foothills, from Butte to Madera Counties. Variety *rubellus* occurs only in the Santa Cruz and Santa Lucia Mountains, from San Mateo Co. to San Luis Obispo Co., and on Santa Cruz Island, Santa Barbara Co. *NOTE*: plants from the lowermost elevations of the Tassajara region (in the Arroyo Seco area), with nearly white perianth segments (except for reddish streaking), approach the typical form of the species. ⊛April-June.

Calochortus invenustus Greene. PLAIN MARIPOSA (p. 194). *HABIT*: bulbous perennial herbs with stems ranging from about 1.5 to 5 dm. (6-20") tall. *LEAVES*: linear, the basal leaves about 1 to 2 dm. long and withering early, while the upper leaves are reduced in size and involute. *INFLORESCENCE*: flowers are singular or in umbel-like racemes of up to six flowers. *PERIANTH*: broadly campanulate, the three outer segments lance-ovate and about 2 to 3 cm. long, the three inner segments cuneate-obovate, about 1.5 to 4 cm. long, and pale lavender to purplish. *FRUIT*: a lance-linear capsule about 5 to 7 cm. long. *OCCURRENCE*: scattered on small serpentine plugs in mixed evergreen forests along the Pine Ridge Trail between the Church Creek Divide and Pine Ridge, and on the much larger serpentine outcrop that extends from Pine Ridge to Bear Basin. According to Griffin ('75), this species is also rare on serpentine plugs on Chew's Ridge. As this species is most commonly found granitic soils, it is probably more widely distributed in this region. *DISTRIBUTION*: Sierra Nevada, from Tuolumne Co. to the Tehachapi Mts. of Kern Co., with additional populations on Mt. Hamilton (Santa Clara Co.), on San Benito Mt. (San Benito & Fresno Counties), the Santa Lucia Mts. (Monterey Co.), and the Laguna Mts. (San Diego Co.), generally in montane coniferous forests between 4,500 and 9,800 ft. elevation. ⊛May-June.

Calochortus splendens Douglas ex Benthham. LILAC MARIPOSA (p. 194). *HABIT*: bulbous perennial herbs that annually produce upwardly branching stems ranging from about 2 to 6 dm. (8-24") tall. *LEAVES*: linear and about 2 to 20 cm. long, the largest basal and withering with the growth of the stem, the cauline becoming increasingly reduced in length upward on the stem and branches, the upper-most bract-like. *INFLORESCENCE*: flowers are singular and terminal on the branches. *PERIANTH*: campanulate, the outer segments lance-ovate and about 2 to 3 cm. long, the inner obovate and about 3 to 5 cm. long, dark to pale lilac, and with long fungus-like hairs on the gland. *FRUIT*: a linear and angled capsule about 2 to 7 cm. long. *OCCURRENCE*: scattered in both woodlands and chaparral on Chew's Ridge, from China Camp northward, and locally common on serpentine plugs, but not known to occur elsewhere in this region. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Colusa Co. to northern Baja California. Also on Santa Catalina Island. ⊛May-June.

CHLOROGALUM.

Five species of the California Floristic Province.

Chlorogalum pomeridianum (deCandolle) Kunth. SOAP PLANT, AMOLE (p. 194). *HABIT*: bulbous perennial herbs with erect and upwardly freely-branched stems ranging from about 6 to 25 dm. (2-8+') tall. *LEAVES*: the blade-like but wavy basal leaves are produced in rosettes and range from about 3 to 7 dm. long, while the much reduced and often bract-like cauline leaves are remotely scattered. *INFLORESCENCE*: the flowers are produced on a broad panicle on pedicels about 5 to 35 mm. long. *PERIANTH*: divided to the base into six linear segments about 15 to 25 mm. long, the segments are white with a green or purple mid-vein. *FRUIT*: a roundish capsule about 5 to 7 mm. long. *OCCURRENCE*: conspicuous by its rarity in this region, for I have seen this taxon in only two locations: at the start of the Pine Ridge Trail just off Tassajara Road, and along the Arroyo Seco River in the vicinity of the confluence of Tassajara Creek. *NOTE*: the bulbs of this species produce a lather when wet, and were used as a soap by indigenous peoples of California. *DISTRIBUTION*: widely distributed in the California Floristic Province, from southern Oregon to San Diego Co. ⊛May-Aug.

DICHELOSTEMMA.

Five species of western North America. All of the species occur in California, and three are endemic to the California Floristic Province.

Dichelostemma capitatum Alphonso Wood [*Brodiaea pulchella* (Salisbury) Greene, *B. capitata* Bentham, *D. pulchellum* (Salisbury) Heller]. BLUE DICKS (p. 194). *HABIT*: bulbous perennial herbs with scapes ranging from about 3 to 9 dm. (1-3') tall. *LEAVES*: usually two but sometimes one or three, long-linear and grass-like, strictly basal, commonly laying on the ground or on other plants, and ranging from about 1.5 to 4 dm. long and about 5 to 12 mm. wide. *INFLORESCENCE*: head-like terminal umbels comprised of about 2 to 15 flowers. *PERIANTH*: blue to purplish-blue or sometimes quite pale, about 11 to 19 mm. long, six-lobed above and united below into a cylindric to bell-shaped tube about 4 to 7 mm. long. *FRUIT*: an ovoid capsule about 4 to 6 mm. long. *OCCURRENCE*: widespread and locally common in open habitats in the Tassajara region, and one of the most common of the local wildflowers. *DISTRIBUTION*: nearly throughout California, north to Oregon, and south to northern Baja California. Also in Utah and Arizona. ⊛ April-May.

DISPORUM.

About fifteen species of temperate North America and eastern Asia.

⇩**Disporum hookeri** (Torrey) Nichols [*D. h.* var. *trachyandrum* (Torrey) Q. Jones]. FAIRY BELLS (p. 195). *HABIT*: perennial herbs from slender rootstocks, with generally erect and leafy stems ranging from about 3 to 8 dm. (12-32") long. *LEAVES*: alternate, ovate to oblong-ovate and clasping the stem at the base, and about 3 to 15 cm. long. *INFLORESCENCE*: terminal and comprised of one to several pendulous flowers. *PERIANTH*: divided to the base into two series of three greenish to creamy-white and narrowly elliptic to oblanceolate segments about 8 to 15 mm. long. *FRUIT*: an ovoid to globose scarlet berry about 7 to 9 mm. wide. *OCCURRENCE*: scattered in shady and often wet or seasonally wet habitats at higher elevations in this region. Plants are fairly regularly encountered in suitable habitats along the Pine Ridge Trail between Tassajara Road and the first summit to the west, and between the Church Creek Divide and Pine Ridge. *DISTRIBUTION*: from British Columbia and Montana to California, where it extends southward in the Coast Ranges to the Santa Lucia Mts. of San Luis Obispo Co., and to Tulare Co. in the Sierra Nevada. ⊛ March-May.

FRITILLARIA. FRITILLARY.

Approximately 100 species of temperate North America and Eurasia.

1a. Plants mostly about 2 to 12 dm. (8-48") tall. Middle cauline leaves produced in whorls. . . . . ***F. affinis***.
1b. Plants mostly about .7 to 2 dm. (3-8") tall. Leaves alternate. . . . . ***F. falcata***.

Fritillaria affinis (Schultes) Sealy [*F. lanceolata* Pursh]. CHECKER-LILY, MISSION BELLS (p. 195). *HABIT*: bulbous perennial herbs with erect stems ranging from about 2 to 12 dm. (8-48") tall. *LEAVES*: about 4 to 16 cm. long and generally narrowly lanceolate, the lower whorled and the upper alternate. Seldom noted are the singular basal leaves, for they are produced and shed in advance of the rising of the stem. These leaves have long petioles which terminate with very broadly obovate blades. *INFLORESCENCE*: terminal racemes in which the flowers are produced in the axils of the upper leaves on typically recurving pedicels about 5 to 25 mm. long. *PERIANTH*: divided to the base into oblong to ovate segments about 1.5 to 4 cm. long. The coloration of the segments range from brown-purple and mottled with yellow and white, to pale greenish-yellow and faintly mottled with purple. *FRUIT*: a six-angled capsule about 1.5 to 2.5 cm. long. *OCCURRENCE*: I have seen this species at two sites in this region: in shady and seasonally moist depressions within a few hundred feet southwest of the four-way trail intersection at the Church Creek Divide, and on Pine Ridge, mostly on serpentine rock in the generally open area west of the trail. According to Griffin ('75), it is also present on Chew's Ridge, but uncommon. *DISTRIBUTION*: British Colombia and Idaho southward, through the Cascades and Coast Ranges, to Ventura Co. ⊛Feb.-June.

Fritillaria falcata (Jepson) Beetle. TALUS FRITILLARY (p. 195). *HABIT*: small bulbous perennial herbs with stems ranging from about 7 to 20 cm. (3-8") tall. *LEAVES*: two to six, broadly linear but upwardly folded and curved like a sickle, fleshy toward the base, and about 4 to 8 cm. long. *INFLORESCENCE*: flowers are singular and terminal or produced in two to four flowered terminal racemes. *PERIANTH*: divided to the base into six obovate segments about 15 to 22 mm. long, which are greenish externally and mottled rusty-brown and yellow internally. *FRUIT*: a three valved and sharply angled capsule about 2 cm. long. *OCCURRENCE*: rare and apparently rather ephemeral on north facing granitic-talus slopes along the Pine Ridge Trail above Bear Basin (near the Tassajara Canyon overlook), and on serpentine talus on Pine Ridge. The former population was discovered by Ronald Branson and the latter by Vern Yadon, both in early July of 1980 (Yadon '80 c & d). As talus slopes are rather common in areas of the Tassajara region that are not accessible by trails, the species is probably more widely scattered in this region. *DISTRIBUTION*: a rare species of serpentine talus slopes in the Diablo Range, from Santa Clara Co. to southern San Benito County and southeastern Monterey County, and on granitic and serpentine talus slopes in the Santa Lucia Mountains of Monterey Co. ⊛March-May.

LILIUM. LILY.

About 90 species of the northern hemisphere and tropical mountains of eastern Asia.

Lilium pardalinum Kellogg. LEOPARD LILY, PANTHER LILY, TIGER LILY (p. 195). *HABIT*: bulbous perennial herbs with erect stems ranging from about 1 to 2 m. (40-80") tall. *LEAVES*: lanceolate to linear and about .3 to 2 dm. long and 6 to 25 mm. wide, the lower and upper-most are singular and alternate, while the middle leaves are produced in remote whorls of three's to eight's. *INFLORESCENCE*: terminal racemes in which the showy flowers face more or less downward on reflexed pedicels about 6 to 12 cm. long. *PERIANTH*: divided into six lanceolate and strongly reflexed segments about 5 to 11 cm. long; the segments are reddish-orange and speckled with maroon spots. *FRUIT*: a three-celled capsule about 3 to 6 cm. long. *OCCURRENCE*: widely scattered in wet and usually shady habitats in the Tassajara region, but fairly rare, although locally common along Church Creek above The Caves. A colony has long been established above the "Cascades" or "Bathtub Spring" along Tassajara Road (twelve plants were counted at this site in June of 1992), and a single plant has persisted for many years in a rock-crevice on the south bank of the deepest pool at The Narrows. *DISTRIBUTION*: Coast Ranges, from Humboldt Co. to Santa Barbara Co., and in the Sierra Nevada, as far south as Kern Co. Also in the mountains of San Diego Co. ⊛ May-July.

SMILACINA. FALSE SOLOMON'S SEAL.

About 25 species of northern temperate regions.

Smilacina stellata (Linnaeus) Desfontaines [*S. s.* var. *sessilifolia* (Baker) Henderson]. SLIM SOLOMON (p. 195). *HABIT*: perennial herbs from creeping rootstocks, the leafy stems are erect or ascending and ranging from about 3 to 6 dm. (1-2') long. *LEAVES*: alternate, sessile, lanceolate to ovate-lanceolate, and about 5 to 15 cm. long. *INFLORESCENCE*: flowers are small and borne on ascending pedicels about 5 to 15 mm. long in terminal racemes about 2 to 8 cm. long. *PERIANTH*: white and divided into six narrowly oblong segments about 4 to 7 mm. long. *FRUIT*: roundish reddish-purple to blackish berries about 7 to 10 mm long. *OCCURRENCE*: widely scattered in wet or moist habitats in the Tassajara region, but fairly rare. *DISTRIBUTION*: Pacific Slope, from British Columbia southward, through the Sierra Nevada and Coast Ranges, to the Transverse and northern Peninsular Ranges (Mt. San Jacinto, Riverside Co.). Also in much of eastern North America. ⊛ March-May.

TRITELEIA.

About 14 species of western North America. Twelve species occur in California, and ten are endemic to the California Floristic Province.

Triteleia ixioides (S. Watson) Greene [*Brodiaea lutea* (Lindley) Morton, *T. l.* Lindley, *B. l.* Watson]. PRETTY FACE, GOLDEN BRODIAEA (p. 195). *HABIT*: bulbous perennial herbs with scapes ranging from about 2 to 8 dm. (8-32") tall. *LEAVES*: usually two, basal, grass-like, and ranging from about 2 to 4 dm. long and 3 to 15 mm. wide. *INFLORESCENCE*: the showy flowers are borne in spreading terminal umbels on pedicels about 1 to 7 cm. long. *PERIANTH*: creamy-yellow, about 1 to 2.5 cm. long, and divided to about two-thirds of the way to the base into six lance-ovate lobes. *FRUIT*: a shortly-oblong capsule about 7 or 8 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, but mostly restricted to clay-loam soils along fault zones (the Church Creek, Willow Creek and Miller Canyon Faults), where it is locally common to abundant in open and grassy habitats. *DISTRIBUTION*: Coast Ranges, from San Mateo and Santa Clara Counties to San Luis Obispo County (subspecies range as far north as Oregon). *NOTE*: this species is often found in association with the very similar-looking *Bloomeria crocea*, from which it can be distinguished by the perianth segments being united for a distance above the base (instead of divided to the base). ⊛April-June.

YUCCA.

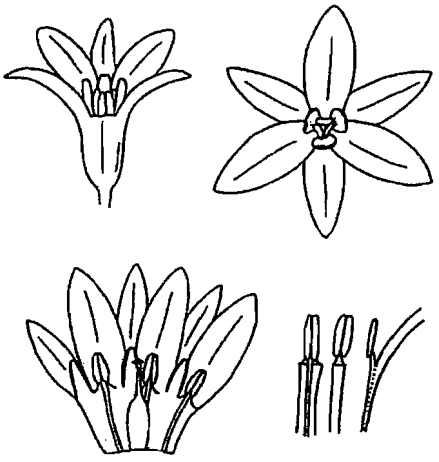
About 40 species primarily of the desert regions of the southwestern United States and northern Mexico.

⇧**Yucca whipplei** Torrey [*Y. w.* subsp. *percursa* Haines, *Hesperoyucca w.* (Torrey) Baker]. OUR LORD'S CANDLE, CHAPARRAL YUCCA, SPANISH BAYONET, QUIXOTE PLANT, "MESCAL" (p. 195). *HABIT*: robust evergreen perennials which at about 6 to 8 years of age produce massive flowering stalks ranging from about 2 to 4 m. (6.5-13') tall. The entire plant dies after the maturation of the seed capsules. *LEAVES*: gray-green and produced in dense and generally doom-shaped basal rosettes. The leaves are stiff and very narrowly lance-linear (and thus sword-like), up to 1 m. long, and terminate with a hardened (and thus dangerously) sharp spine. *INFLORESCENCE*: a massive panicle about 2 m. long, lanceolate to oblanceolate or elliptic in outline, and about three times longer than wide. The numerous branches are crowded with very aromatic flowers which are produced on pedicels about 1 to 3 cm. long. *PERIANTH*: divided into six ovate-lanceolate and creamy-white segments about 2.5 to 3.5 cm. long. *FRUIT*: an oblong to oblong-obovate capsule about 3 to 4 cm. long. *OCCURRENCE*: a common species in openings (especially in rocky openings) on chaparral slopes in the Tassajara region. Due to the extreme topography of the region, seeds often become planted in unsuitable habitats, such as in shady woodlands, but such plants are usually depauperate, and I have not seen such plants in bloom. *DISTRIBUTION*: from Monterey and San Benito Counties in the Coast Ranges, and from Fresno Co. in the Sierra Foothills, to the mountains of southern California and northern Baja California. *NOTES*: *Yucca* species are fertilized through a symbiotic relationship with *Pronuba* moths. Female moths collect pollen from one plant, roll it into a ball, and then carry it to another plant, where they deposit their eggs in a floral ovary, then push the pollen ball down the stigma tube, thus causing fertilization. Although the larva destroy many of the seeds, many are left intact. By at least the late 1870's guests and residents at Tassajara Hot Springs had developed a fascination with the huge flowering stalks of *Yucca whipplei*, which was known to them as "mescal." By 1898 this species had became so closely identified with the resort that a Tassajara correspondent for a Monterey County newspaper signed an article about the social life at the springs under the pseudonym "Mescal." This pseudonym became a tradition, and was used in a large number of newspaper articles about Tassajara Hot Springs until the early 1920's. ⊛May-July.

Allium burlewii

Allium campanulatum

Bloomeria crocea

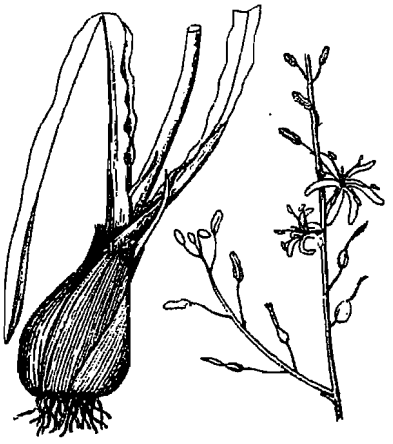


Brodiaea jolonensis

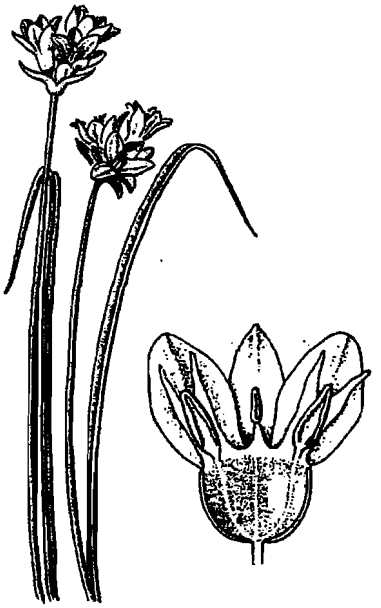
Calochortus albus

Calochortus invenustus

Calochortus splendens

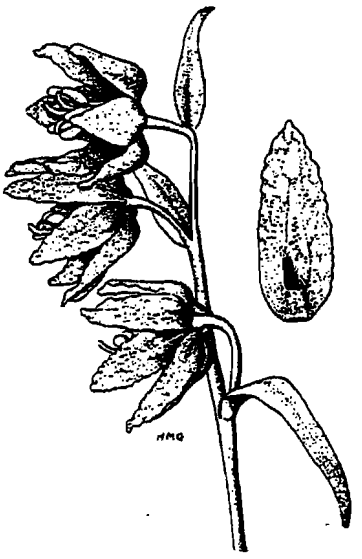


Chlorogalum pomeridianum



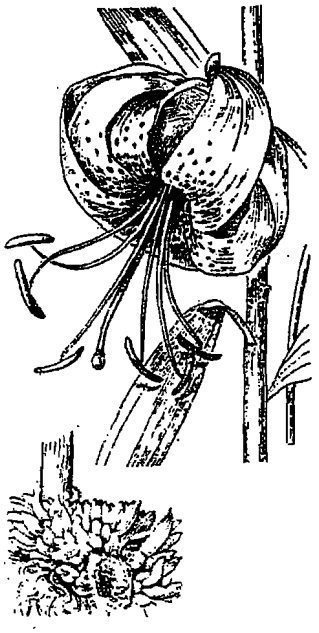
Dichelostemma capitatum

Disporum hookeri



Fritillaria affinis

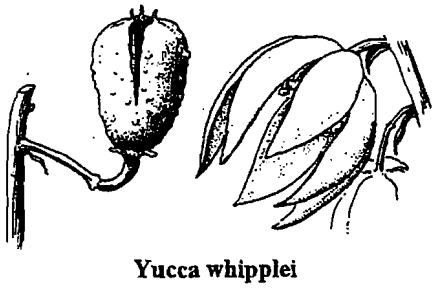
Fritillaria falcata



Lilium pardalinum

Smilacina stellata

Triteleia ixioides



Yucca whipplei

Zigadenus venenosus

Zigadenus fremontii

ZIGADENUS.

About 15 species of temperate North America and Asia.

1a. Plants of wet or moist habitats. Perianth segments 3 to 6 mm. long and exceeded by the stamens in mature flowers. . . . . ***Z. venenosus.***
1b. Plants of dry habitats. Perianth segments 8 to 15 mm. long and exceeding the stamens in mature flowers. . . . . ***Z. fremontii.***

Zigadenus fremontii Torrey. STAR-LILY (p. 195). *HABIT*: bulbous perennial herbs with erect stems ranging from about 3 to 10 dm. (12-40") tall. *LEAVES*: alternate, narrowly-linear and sheathing, and about 2 to 6 dm. long and 8 to 25 mm. wide. *INFLORESCENCE*: terminal and often paniculate racemes about 5 to 40 cm. long; the pedicels are up to 4 cm. long. *PERIANTH*: divided into six lance-ovate and white or yellowish-white segments about 8 to 15 mm. long. *FRUIT*: a three-lobed cylindric capsule about 15 to 35 mm. long. *OCCURRENCE*: lightly scattered in chaparral along the Black Cone Trail between South Ventana Cone and the Elephant's Back, and along the Pine Ridge Trail northeast of Pine Ridge. As this species occurs in a variety of habitats (grasslands, chaparral, mixed evergreen forests, etc.), it may be more widely scattered in this region. *DISTRIBUTION*: Coast Ranges, western Transverse and Peninsular Ranges, from southern Oregon to northern Baja California. ⊛March-May.

Zigadenus venenosus Watson. DEATH CAMAS (p. 195). *HABIT*: bulbous perennial herbs with erect stems ranging from about 2.5 to 6 dm. (10-24") tall. *LEAVES*: alternate, narrowly linear, and about 1 to 4 dm. long. *INFLORESCENCE*: terminal racemes about 5 to 25 cm. long; the flowers are on pedicels about 1 to 2 cm. long. *PERIANTH*: white or whitish and divided into six ovate segments about 3 to 6 mm. long. *FRUIT*: a three-lobed cylindric capsule about 8 to 15 mm. long. *OCCURRENCE*: known from only two sites in this region: in the bed of the Arroyo Seco River near the confluence of Tassajara Creek, and along brooks in Pine Valley. *DISTRIBUTION*: widely scattered in the mountains of temperate western North America. ⊛May-July.

ORCHIDACEAE. ORCHID FAMILY.

With about 736 to 800 genera and 18,000 to 20,120 species worldwide (Thorne '92), *Orchidaceae* is perhaps the largest of all vascular plant families. The family is primarily tropical, and is particularly well represented in tropical rain forests, where most species are epiphytic, i.e., non-parasitic plants which grow on the trunks and branches of trees. The family is the source of many fine ornamentals, and vanilla is derived from the fruit of *Vanilla planifolia*.

1a. Plants saprophytic (without chlorophyll and thus not green, and living off of decaying organic material). Leaves comprised of bladeless sheaths:
2a. Plants white. Sepals 12 to 20 mm. long. . . . . ***Cephalanthera.***
2b. Plants yellowish green to purplish. Sepals less than 10 mm. long. . . . . ***Corallorhiza.***
1b. Plants not saprophytic and thus green. Leaves well developed, at least at the base:
3a. Plants with two broad and strictly basal leaves (upper leaves small bract-like structures). Flowers spurred on lower side. Plants of shady but not wet habitats. . . . . ***Piperia.***
3b. Plants leafy throughout. Flowers not spurred. Plants of streambanks, springs, seeps, etc. . . . . ***Epipactis.***

CEPHALANTHERA. PHANTOM ORCHID.

A primarily Eurasian genus comprised of about 15 species of saprophytic perennial herbs.

Cephalanthera austiniae (Gray) Heller [*Eburophyton austinae* (Gray) Heller] (p. 197). *HABIT*: saprophytic perennial herbs from creeping rootstocks, the stems are erect and range from about 2 to 5.5 dm. (8-22") tall. The entire plant is at first white but becomes yellowish or brownish with age. *LEAVES*: bladeless sheaths about 2 to 6 cm. long. *INFLORESCENCE*: the flowers are produced in dense terminal racemes on pedicel-like floral columns about 4 to 9 mm. long. *PERIANTH*: about 12 to 20 mm. long, the segments elliptic to oblanceolate, the lower inner segment (the lip) shorter, folded lengthwise and lobed below and reflexed above the middle, and with a yellow spot. *FRUIT*: a ripening floral column about 4 to 9 mm. long. *OCCURRENCE*: lightly scattered in densely forested areas from Pine Valley to Bear Basin, but not known to occur elsewhere in this region. *DISTRIBUTION*: from British Columbia and Idaho to California, extending southward in the Coast Ranges to the Santa Lucia Mts. of Monterey Co., and to Fresno Co. in the Sierra Nevada, with a disjunct population in the San Bernardino Mts. ⊛May-June.

CORALLORHIZA. CORAL ROOT.

About 10 species of temperate and tropical North America.

Corallorhiza maculata Rafinesque (p. 197). *HABIT*: saprophytic perennial herbs from short coral-like rhizomes, the brownish stems are erect and about 2 to 7 dm. (8-28") tall. *LEAVES*: bladeless sheaths. *INFLORESCENCE*: the flowers are borne in spike-like racemes on pedicels about 3 to 5 mm. long. *PERIANTH*: the three outer segments are about 7 to 10 mm. long and about the same color as the stems, the inner segments are shorter, the lower inner segment (the lip) is irregularly lobed and white with crimson-veins and spots, while the upper segments are entire and crimson to deep-pink. A spur less than 2.5 mm. long is located at the lower base of the perianth. *FRUIT*: a three-valved and minutely seeded capsule about 15 to 25 mm. long. *OCCURRENCE*: occasional in densely wooded areas on Chew's Ridge and the upper regions of Miller's Canyon, such as along the Pine Ridge Trail between Tassajara Road and the first summit to the west, and perhaps in other suitable habitats in this region above about 3,000 ft. A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3236 DS) was collected, according to the note enclosed in an envelope pasted to the specimen sheet, in "Fir Canyon above big oak" (probably the Ventana Mesa Creek canyon). *DISTRIBUTION*: from Newfoundland and North Carolina to British Columbia, and southward, along the Pacific Slope, to the Santa Lucia Mts. in the Coast Ranges, and through the Sierra Nevada, to the higher mountains of southern California, as far south as San Diego Co. Also in Guatemala. In California this species occurs mostly between 3,000 and 9,000 ft. ⊛June-Aug.

EPIPACTIS. STREAM ORCHID, HELLEBORINE.

About 25 species of North America, Eurasia and North Africa.

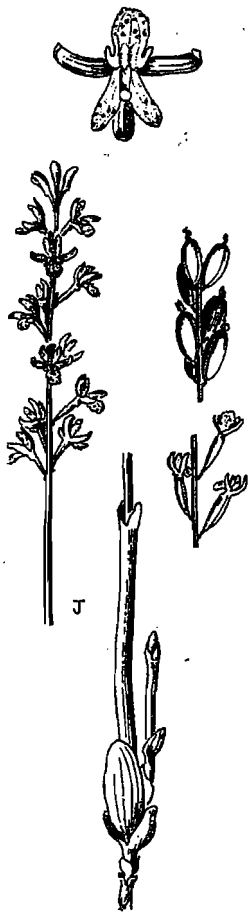
Epipactis gigantea Douglas ex Hooker. GIANT STREAM ORCHID (p. 197). *HABIT*: perennial herbs of riparian habitats with erect or ascending and leafy stems ranging from about 3 to 9 dm. (1-3') tall. *LEAVES*: alternate and sheathing, generally ovate-lanceolate, and about 5 to 15 cm. long. *INFLORESCENCE*: terminal spike-like racemes with the flowers produced singularly in the axils of the reduced upper leaves; the floral columns are about 4 to 9 mm. long. *PERIANTH*: the three outer segments are concave, about 12 to 20 mm. long, and light green with reddish-purple veins, the dorsal segment is smaller and generally elliptic-lanceolate, while the lateral segments are ovate to lance-ovate. The upper two inner segments are about 13 to 15 mm. long and purplish to reddish, while the lower segment (the lip) is about 14 to 20 mm. long, the lower half broad, concave, and yellowish with reddish-purple veins, the upper half narrowed, grooved, twice constricted, and yellow and reddish-tinged or veined below. *FRUIT*: a three-valved and minutely seeded capsule about 20 to 28 mm. long. *OCCURRENCE*: rare in the Tassajara region, for I have seen only one plant growing from a seepy crack in a boulder along Tassajara Creek between the Horse Pasture Trail crossing and the Arroyo Seco River. A. D. E Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3220 DS) was collected, according to the note enclosed in an envelope attached to the specimen sheet, at the "fall in Fir Canyon" (probably the canyon of Ventana Mesa Creek). *DISTRIBUTION*: widely scattered in temperate western North America, from British Columbia to South Dakota, Texas and northern Baja California. ⊛May-Aug.

PIPERIA. REIN ORCHID.

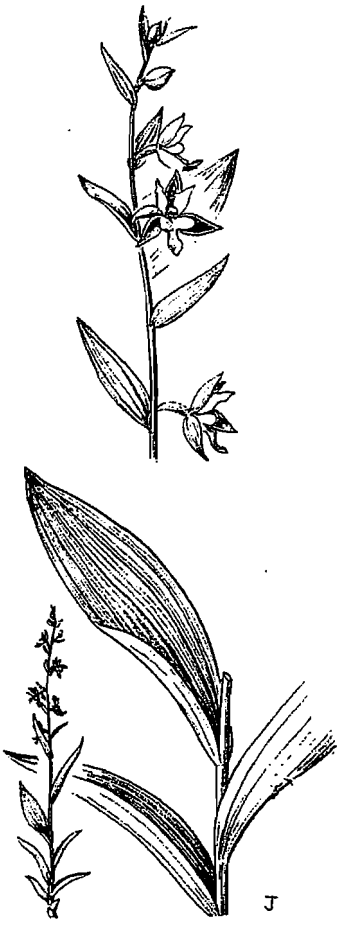
About nine species of western North America.

Piperia elongata Rydberg [*Piperia elegans* (Lindley) Rydberg, *Habenaria elegans* (Lindley) Bolander]. SLENDER REIN ORCHIS (p. 197). *HABIT*: bulbous perennial herbs which annually produce a slender and erect stem ranging from about 3 to 7 dm. (12-28") tall. *LEAVES*: two, basal and subopposite, tending to lay on the ground, generally oblong to oblanceolate, up to 3 dm. long and 7.5 cm. wide, and withering with the growth of the stem. Upper "leaves" are small bract-like structures. *INFLORESCENCE*: narrow spikes up to 6 dm. long, with the small flowers borne on somewhat inflated floral columns about 5 to 8 mm. long. *PERIANTH*: the segments are dissimilar, about 4 to 6.5 mm. long, and pale-green to greenish-white but turning reddish-brown with age. Protruding from the base of the perianth is a narrow and curving spur ranging from about 6 to 14 mm. long. *FRUIT*: a narrowly cylindric capsule containing numerous minute seeds. *OCCURRENCE*: widely scattered but generally uncommon in shady habitats in the Tassajara region, and found primarily in mixed evergreen forests and in dense stands of tall *Ceanothus* dominated chaparral. *DISTRIBUTION*: British Columbia and Montana southward, through the Coast Ranges, Sierra Nevada and mountains of southern California, as far south as San Diego Co. ⊛May-Sept.

Cephalanthera austiniae



Corallorhiza maculata



Epipactis gigantea

Piperia elongata

POACEAE (*Gramineae*). GRASS FAMILY.

An ubiquitous family of worldwide distribution, consisting of about 650 to 900 genera and 10,000 species. Although in the number of species *Poaceae* ranks as the fourth largest vascular plant family (exceeded by *Orchidaceae* [±736-800/±18,000-20,120], *Asteraceae* [±1,160-1,300/±19,085-21,000] and *Fabaceae* [±630-650/±18,000]), *Poaceae* species typically greatly excel in the multitudes of extant plants. Thus, as a whole, *Poaceae* is the largest vascular plant family in regards to the total percentage of the earth's terrestrial vegetation, and it is estimated that in the present epoch grasses dominate 25% of the land surface of the planet. Grasses are generally common to abundant in nearly all regions of the Earth, and are absent only in areas that are too cold or too dry to support any form of flowering plant life (De Wet '81). Fossil evidence indicates that *Poaceae* probably first began evolving during the late Cretaceous period (about 65 million years ago), and that the extensive grassland ecosystems (prairies, savannas, steppes, etc.) co-evolved with rise of the large mammalian herbivores starting by at least the early Miocene (about 26 million years ago) (De Wet '81, Stebbins '81).

Grasses have also played a critical role in the rise of human civilizations, for they provide the principal source of carbohydrate. Domesticated grasses fueled the development of the early civilizations of the Middle East and Mediterranean Region (primarily wheat), the Indian Subcontinent (primarily rice and wheat), China (primarily rice and wheat), and Central America (maize). Other grass species that have been domesticated include rye, barley, oats, and several species each of millet and sorghum (which are major food sources in Africa), and sugar cane (*Saccharum*). As grasses are used extensively as both forage and feed for domestic livestock, they play a major role in the production of meat, eggs and dairy products. In East Asia the bamboos are very important sources of building and manufacturing materials, and kusa grass is used extensively in the manufacture of flooring materials, such as the Japanese tatami mats. Grasses are also extensively used as ornamentals, especially in the form of lawns.

Human activities, such as the practice of agriculture, the trade of agricultural goods, migrations and especially the European colonization's of the last 500 years, have greatly altered the natural distribution of many grass species, perhaps to a greater extent than that of any other family of flowering plants. This is particularly true in California, were European annuals now dominate most of the grassland habitats within the state. Although the exact nature of the pristine grasslands of the California Floristic Province is lost in antiquity (the only historical descriptions of such habitats are so scant in specific information that definite conclusions can not be made), the great majority of the native grasses are perennial, while the majority of introduced species are annual. It is thus fairly certain that the pristine grasslands of California were dominated by perennial bunch grasses (Ornduff '74; Bartolme & Gemmill '81; Wester '81, etc.).

1a. Spikelets comprised of one perfect (grain-producing) floret and one imperfect (staminate/sterile) floret, the imperfect floret situated on the outside base of the spikelet, and covered by a small scale-like glume. Glumes not persistent, and fall with the mature lemmas. *PANICOIDEAE*:

2a. Glumes without awns or barbs. Panicle branches sparsely flowered. . . . . ***Panicum***.

2b. Glumes awned and covered with upwardly curving barbs. Panicle branches densely flowered. . . . . ***Echinochloa***.

1b. Spikelets comprised of one to many florets. Imperfect (sterile/staminate) florets, if present, positioned at the top of the spikelet axis, above the perfect florets. Glumes persistent in most species (except for *Polypogon* and *Agrostis viridis*), and remaining on the inflorescence well after the lemmas have fallen:

3a. Inflorescence comprised of palmately (digitally) divided panicles (the branches diverging from a common point). Spikelets borne in two overlapping rows on the upper side of the rachis (axis). *CHLORIDEAE*. . . . . ***Cynodon dactylon***.

3b. Inflorescence spike-like or paniculate, if paniculate, then not palmately divided. Spikelets borne on more than one side of the rachis. *POOIDEAE*:

4a. Spikelets borne in spikes, i.e., the spikelets are sessile along the axis of an unbranched inflorescence (bend the inflorescence if not sure). Mostly *TRITICEAE* (*Lolium* in *Poeae*):

5a. Spikelets produced in groups of three's, each spikelet with one fertile floret. Glumes awn-like. . . . . ***Hordeum***.

5b. Spikelets produced singularly or in groups of two's to four's, each spikelet with two or more fertile florets. Glumes awn-like only in *Elymus multisetus*:

6a. Spikelets mostly two to four at each node. . . . . ***Elymus***.

6b. Spikelets singular at each node:

7a. Spikelets appressed to the side of the rachis. . . . . ***Elymus***.

7b. Spikelets turned edgewise to the rachis. . . . . ***Lolium***.

4b. Spikelets borne in panicles, i.e., the spikelets are pedunculate (or sessile) on a branching inflorescence (panicles with short and upwardly appressed branches may at first appear to be spikes– bend the inflorescence if not sure):

8a. Glumes slightly to much longer than the first (and sometimes only) lemma, and in most species partially obscuring to entirely concealing the lemma(s). Lemma awns, if present, are mostly in some way bent or twisted:

9a. Lemma awns terminal and not borne from a bifid (two-lobed) apex. Tufted perennial herbs. *STIPEAE*:

10a. Culms stout and mostly 1 to 2 m. tall. Panicle branches upwardly contracted. Blades flat and mostly about 5 to 10 mm. wide. . . . ***Achnatherum***.

10b. Culms relatively slender and generally less than 1 m. tall. Panicle branches upwardly ascending to spreading. Blades mostly involute and less than 4 mm. wide. . . . . ***Nassella***.

9b. Lemma awns, if present, are mostly not terminal, but if so, then from a bifid apex. Annual or perennial herbs. *AVENEAE*:

11a. Spikelets producing two or more lemmas:

12a. Glumes 12 to 30 mm. long and 5 to 7 veined. . . . . ***Avena***.

12b. Glumes not more than 10 mm. long and no more than 5 veined:

13a. Delicate annual herbs. Panicle branches spreading. . . . . ***Aira***.

13b. Perennial bunch grasses. Panicle branches upwardly contracted:

14a. Spikelets with two lemmas, the lemmas awned. Restricted to wet habitats. . . . . ***Deschampsia***.

14b. Spikelets with two to four lemmas, the lemmas not or only minutely awned. Widely scattered in dry habitats. . . . . ***Koeleria***.

11b. Spikelets producing only one lemma:

15a. Glumes awned and readily deciduous (falling with the matured lemmas). . . . . ***Polypogon***.
15b. Glumes not awned and (except for *Agrostis viridis*) persistent (remaining on the panicle after the lemmas have fallen):
16a. Glumes and lemma awns three or more times longer than the lemma. . . . . ***Gastridium***.
16b. Glumes and lemma-awns less than twice as long as the lemma:
17a. Lemma base glabrous or with hairs less than 1 mm. long. Palea less than 1/3 as long as the lemma. . . . . ***Agrostis***.
17b. Lemma base with hairs generally 1 to 4 mm. long. Palea about as long the lemma. . . . . ***Calamagrostis***.
8b. Glumes shorter to nearly as long as the first lemma, and not concealing the lemmas. Lemma awns, if present, originate from the apex and are straight. *POEAE* and *MELICEAE* (*Melica* only):
18a. Lemmas not awned:
19a. Annual herbs. Lemmas strongly keeled (creased) on the back side and about 2 to 4 mm. long. . . . . ***Poa***.
19b. Perennial herbs. Lemmas more or less rounded on the back side and 3 to 11 mm. long:
20a. Lemmas 3 to 5 mm. long and three to seven per spikelet. Glumes not paper-like or translucent (or translucent only on the upper margins), faintly three to five veined, the midvein strongly creased and elevated, at least at the base. . . . . ***Poa***.
20b. Lemmas 3 to 11 mm. long, and if less than 5 mm. long, then the spikelets have only one (or rarely two) fully developed lemmas. Glumes paper-like or translucent, often clearly five or more veined, the mid-vein not sharply creased or noticeably elevated. . . . . ***Melica***.
18b. Lemmas awned or most lemmas awned (sometimes minutely so):
21a. Lemmas without a bifid apex, the awn a simple extension of the lemma:
22a. Spikelets strongly compressed and borne in dense one-sided clumps at the ends of relatively stiff panicle branches. Lemma awns .5 to 2 mm. long. . . . . ***Dactylis***.
22b. Spikelets not strongly compressed and not borne in dense one-sided clumps. Lemma awns 2 to 15 mm. long:
23a. Perennial herbs. Stamens three. . . . . ***Festuca***.
23b. Annual herbs. Stamens usually one. . . . . ***Vulpia***.
21b. Lemmas with a bifid (2-lobed) apex (sometimes minutely so), the awns protruding from between the lobes:
24a. Glumes translucent and/or paper-like. Lemmas clearly veined. Glumes and lemmas rounded on the back side. . . . . ***Melica***.
24b. Glumes not translucent or paper-like (except perhaps on the margins). Lemmas faintly veined. Glumes and/or lemmas creased or rounded on the back side:
25a. Annual herbs. . . . . ***Bromus***.
25b. Perennial herbs:
26a. Lemmas body 7 to 17 mm. long. . . . . ***Bromus***.
26b. Lemma body 4 to 7 mm. long:
27a. Spikelets not strongly compressed and not borne in dense one-sided clumps. Lemma awns 2 to 5 mm. long. . . . . ***Festuca elmeri***.
27b. Spikelets strongly compressed and borne in dense one-sided clumps at the ends of relatively stiff panicle branches. Lemma awns .5 to 2 mm. long. . . . . ***Dactylis***.

ACHNATHERUM.

About 75 species of perennial herbs of temperate regions nearly worldwide. Segregated from *Stipa*.

Achnatherum coronatum (Thurber) Barkworth [*Stipa coronata* Thurber]. GIANT STIPA, GIANT NEEDLE-GRASS (p. 201). *HABIT*: large and densely cespitose perennials with stout culms ranging from about 1 to 2 m. (40-80") tall. *BLADES*: flat and ranging from about 3 to 6 dm. long and 5 to 10 mm. wide. *INFLORESCENCE*: a large panicle ranging from about 3 to 6 dm. long, with upwardly contracted and densely floriferous branches. *SPIKELETS*: one-flowered, the lower glume is about 16 to 21 mm. long, and the upper glume is about 11 to 18 mm. long. *LEMMAS*: about 9 mm. long, densely covered with long appressed hairs which fan out beyond the apex, and terminated by a twice sharply bent awn about 25 to 45 mm. long. *OCCURRENCE*: widespread in open and often rocky habitats in the Tassajara region, primarily in openings in chaparral, and common in many areas. *DISTRIBUTION*: outer Coast, Transverse and Peninsular Ranges, from Napa Co. to northern Baja California. This is the largest grass species in the Tassajara region. ⊛April-June.

AGROSTIS. BENT-GRASS.

About 200 species mostly of temperate to colder regions of the Americas and Eurasia.

1a. Glumes readily separting and falling with the matured lemmas. . . . . ***A. viridis***.
1b. Glumes persistent, remaining on the panicle after the lemmas have fallen:
2a. Panicle densely floriferous, the branches erect to ascending. Sheaths glabrous. . . . . ***A. exarata***.
2b. Panicle sparsely floriferous, the branches ascending to spreading. Sheaths pubescent. . . . . ***A. pallens***.

Agrostis exarata Trinius. WESTERN BENT-GRASS, SPIKE BENT-GRASS (p. 201). *HABIT*: moderately to densely cespitose perennial herbs with culms ranging from about 2 to 12 dm. (1-4') tall. *BLADES*: about 4 to 15 cm. long and 2 to 10 mm. wide. *INFLORESCENCE*: a dense panicle with upwardly ascending branches bearing hundreds of small spikelets. *SPIKELETS*: one-flowered, the glumes are subequal and about 2.5 to 4 mm. long. *LEMMA*: about 1.7 to 2 mm. long and terminated by a small prickle or awn, or sometimes short-awned from above the middle. *OCCURRENCE*: scattered along streams and in other generally wet or moist habitats in the Tassajara region. *DISTRIBUTION*: widely distributed in western North America, from Alaska to northern Mexico. ⊛June-Aug.

Agrostis pallens Trinius [*A. diegoensis* Vasey]. LEAFY-BENT-GRASS, THIN-GRASS (p. 202). *HABIT*: loosely cespitose rhizomatic perennials with culms ranging from about 4 to 10 dm. (16-40") tall. *BLADES*: flat or sometimes involute, rather lax, and about 2 to 3 dm. long and 2 to 6 mm. wide *INFLORESCENCE*: a relatively narrow panicle comprised of loosely ascending branches. *SPIKELETS*: one-flowered, the glumes

are nearly equal in length and about 2.5 to 3 mm. long. *LEMMA*: about 1.5 to 2.5 mm. long and without and awn. *OCCURRENCE*: lightly scattered on shady and seasonally moist woodland slopes in the vicinity of Tassajara Hot Springs and along Willow Creek, and perhaps in other areas. *DISTRIBUTION*: from Montana and British Columbia southward, along the Pacific Slope, to San Diego Co. *NOTE*: this species is reported to have a common form in which the lemmas are awned. ⊛April-Aug.

***Agrostis viridis** Gouan [*A. semiverticillata* (Forsskal) C. Christensen, *A. verticillata* Villars, *Polypogon semiverticillatus* (Forsskal) Hylander, *P. viridis* (Gouan) Breistroffer]. WATER BENT-GRASS (p. 202). *HABIT*: small perennial herbs typically with decumbent culms ranging from about 1 to 4 dm. (4-16") tall. *BLADES*: about 3 to 18 cm. long and 2 to 10 mm. wide. *INFLORESCENCE*: an erect and many-flowered panicle with upwardly contracted to ascending (and often whorled) branches. *SPIKELETS*: very small and one-flowered, the glumes equal in length, about 2 mm. long, and falling with the matured lemma. *LEMMA*: about 1 mm. long and without an awn. *OCCURRENCE*: scattered in streambeds and other moist places in the Tassajara region. *DISTRIBUTION*: a common weed in tropical and temperate regions of the Western Hemisphere; native to Africa and Eurasia. ⊛May-June.

AIRA. HAIR-GRASS.

About 10 species of southern Europe.

***Aira caryophyllea** Linnaeus [*Aspris c.* (L.) Nash]. SILVER HAIR-GRASS (p. 202). *HABIT*: small annual herbs with slender culms ranging from about 1 to 3 dm. (4-12") tall. *BLADES*: mostly basal and nearly filiform, and about .5 to 7 cm. long and .5 to 2 mm. wide. *INFLORESCENCE*: an open and spreading panicle with extremely slender branches. *SPIKELETS*: two-flowered, the glumes silvery-shiny, about 3 mm. long, and completely enclosing the lemmas. *LEMMAS*: about 1.5 to 2 mm. long; the awn is about 3 to 4 mm. long. *OCCURRENCE*: widely scattered in the Tassajara region, and locally common in areas with poor or sandy soils. *DISTRIBUTION*: a common weed on the Pacific Slope; native to Eurasia. ⊛April-May.

AVENA. OAT.

About 10 to 15 species of temperate Eurasia. The domestic oat is *Avena sativa*.

1a. Glumes 20 to 30 mm. long. Lemmas with two pronounced bristles at the apex about 3 to 4 mm. long. Foliage generally glabrous. . . . . ***A. barbata.***

1b. Glumes 12 to 18 mm. long. Lemmas with a minutely bifid apex, the portions less than 1 mm. long. Foliage sparsely pubescent. . . . . ***A. fatua.***

***Avena barbata** Brotero. SLENDER WILD OAT (p. 202). *HABIT*: annual herbs with relatively slender culms ranging from about 3 to 6 dm. (1-2') tall. *BLADES*: flat and about 2 to 6 mm. wide. *INFLORESCENCE*: an open and typically nodding panicle with the spikelets tending to hang rather pendulously on the spreading branches. *SPIKELETS*: mostly two-flowered, the glumes nearly equal in length and about 18 to 30 mm. long. *LEMMA*: about 12 to 18 mm. long and with a twisted awn protruding from the back. *OCCURRENCE*: scattered in grasslands and other open habitats in the Tassajara region, but much less common than *A. fatua*. *DISTRIBUTION*: widespread in western North America; native to the Mediterranean Region. ⊛ March-May.

***Avena fatua** Linnaeus. WILD OAT (p. 202). *HABIT*: highly conspicuous annual herbs with culms ranging from about 3 to 12 dm. (1-4') tall, or sometimes as much as 2 m. (6.5') tall. *BLADES*: flat and about 4 to 12 mm. wide. *INFLORESCENCE*: an open and typically nodding panicle with the spikelets hanging pendulously on widely spreading branches. *SPIKELETS*: usually three-flowered, the glumes nearly equal and about 18 to 25 mm. long. *LEMMA*: about 14 to 20 mm. long, and with a bent awn about 25 to 40 long originating from about the middle of the back side. *OCCURRENCE*: common in open habitats in the Tassajara region, especially in grasslands and savannas. *DISTRIBUTION*: one of the most common introduced grass species in western North America, particularly on the Pacific Slope; native to Europe. ⊛Feb.-June.

BROMUS. BROME.

About 150 species of annual and perennial herbs that are widely distributed in temperate regions.

1a. Spikelets strongly compressed, glumes and lemmas sharply creased on the back side. . . . . ***B carinatus.***

1b. Spikelets not strongly compressed, glumes and lemmas generally rounded on the back side:

2a. Lemma awns more than 30 mm. long. . . . . ***B diandrus.***

2b. Lemma awns less than 28 mm. long:

4a. Panicles more or less head-like, the branches short and upwardly appressed or ascending:

5a. Panicles densely bristly, the individual spikelets generally not readily evident. Lemmas narrow and acute at both ends. Lemma awns about 10 to 25 mm. long. . . . . ***B. madritensis rubens.***

5b. Panicles not bristly, the individual spikelets readily evident. Lemmas relatively broad and generally rounded at both ends. Lemma awns less than 10 mm. long. . . . . ***B. hordeaceus.***

4b. Panicles not head-like, the branches generally long and typically spreading and/or drooping:

6a. Annual herbs rarely more than 5 dm. tall (and almost never more than 6 dm. tall). Introduced species that are of erratic distribution in this region:

7a. Lower glume one-veined. Lemmas narrow and tapering to an acute apex. . . . . ***B. tectorum.***

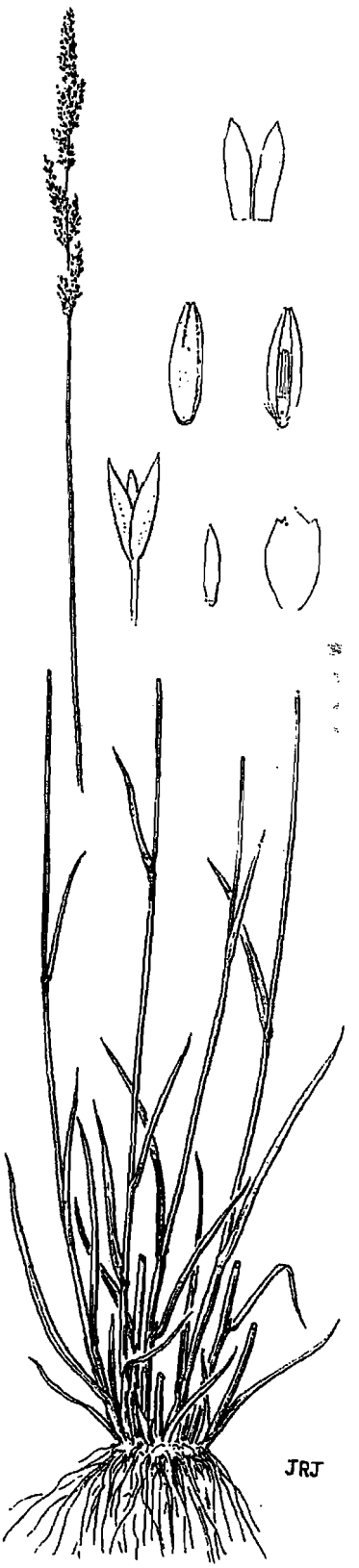
7b. Lower glume three-veined. Lemmas relatively broad and rounded at the apex. . . . . ***B. arenarius.***

6b. Perennial herbs rarely less than 6 dm. tall (and almost never less than 5 dm. tall). Native species that are widely and fairly evenly distributed in suitable habitats in this region:

8a. Upper glume five-veined. Lemma unevenly hairy. Sheaths glabrous or rarely with outwardly spreading hairs. . . . . ***B. laevipes.***

8b. Upper glume three-veined. Lemma evenly pubescent or glabrous. Sheaths with downwardly angled hairs:

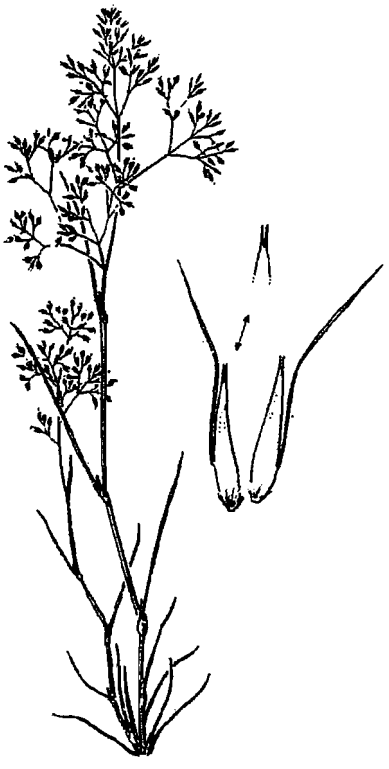
Achnatherum coronatum



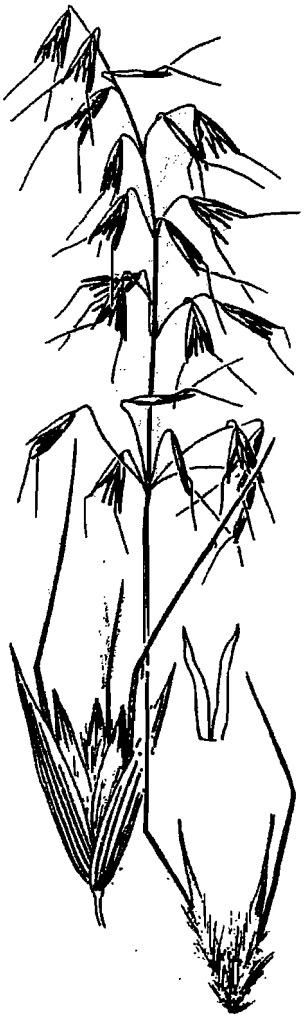
Agrostis exarata

Agrostis pallens

Agrosits viridis



Aira caryophyllea



Avena barbata

Avena fatua

9a. Panicle 14 to 21 cm. long, the main axis and branches nodding to drooping, the spikelets typically hanging in a more or less pendulous manner. . . . . ***B. grandis***.

9b. Panicle 6 to 17 cm. long, the main axis erect and the branches ascending to spreading, the spikelets generally not pendulous. . . . . ***B. orcuttianus***.

***Bromus arenarius** Labillardiere. AUSTRALIAN CHESS, SAND BROME (p. 204). *HABIT*: annual herbs with culms ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: about 6 to 12 cm. long and 2 to 6 mm. wide. *INFLORESCENCE*: open and nodding panicles with very slender (hair-like) and wavy branches, on which the spikelets dangle in a more or less pendulous manner. *SPIKELETS*: about 1 to 1.75 cm. long and five to nine flowered, the glumes are about 5 to 10 mm. long, and the lower glume is shorter than the upper glume. *LEMMA*: about 7 to 10 mm. long and terminated by a slender awn about 6 to 16 mm. long. *OCCURRENCE*: sporadic in grasslands or openings in chaparral in the Tassajara region. In the vicinity of the hot springs it is known to occur at only three sites: a grassland area in The Pines below Lime Point, in an opening in chaparral along Tony's Trail on the hot springs side of the grade, and in the cemetery on the Hog's Back. The Hog's Back plants are likely to be descendant from plants included in bouquets placed at the graves, for the panicles of this species have a very strong ornamental appeal. *DISTRIBUTION*: scattered in California, Oregon and Arizona; native to Australia. Although a number of *Bromus* species now occur in Australia, this is the only one that is native to that continent. ⊛April-June.

Bromus carinatus Hooker & Arnott [*B. marginatus* Nees & Steudel]. CALIFORNIA BROME (p. 204). *HABIT*: annual or perennial herbs with culms ranging from about 5 to 15 dm. (20-60") tall. *BLADES*: flat and about 1.5 to 4 dm. long and 3 to 12 mm. wide. *INFLORESCENCE*: relatively large and generally nodding panicles about 1.5 to 3 dm. long; the branches are loosely ascending to widely spreading. *SPIKELETS*: about 2 to 5 cm. long, strongly compressed, and containing about 6 to 10 flowers. The glumes are sharply creased at the mid-vein, the lower is about 7 to 12 mm. long, and the upper is about 9 to 15 mm. long. *LEMMA*: about 12 to 17 mm. long, strongly keeled on the back side, and terminated by a slender awn about 4 to 15 mm. long. *OCCURRENCE*: widespread and locally common in grasslands and other open or semi-open habitats in the Tassajara region. *DISTRIBUTION*: western North America, from British Columbia to Alberta, South Dakota, New Mexico and northern Baja California. *NOTE*: scattered in wooded areas at higher elevations are plants with erect or upwardly ascending panicles, and lemmas which are closely if at all spaced in maturity, which are terminated by awns less than 8 mm. long. Such plants correspond to a race formerly known as *B. marginatus*. ⊛April-June.

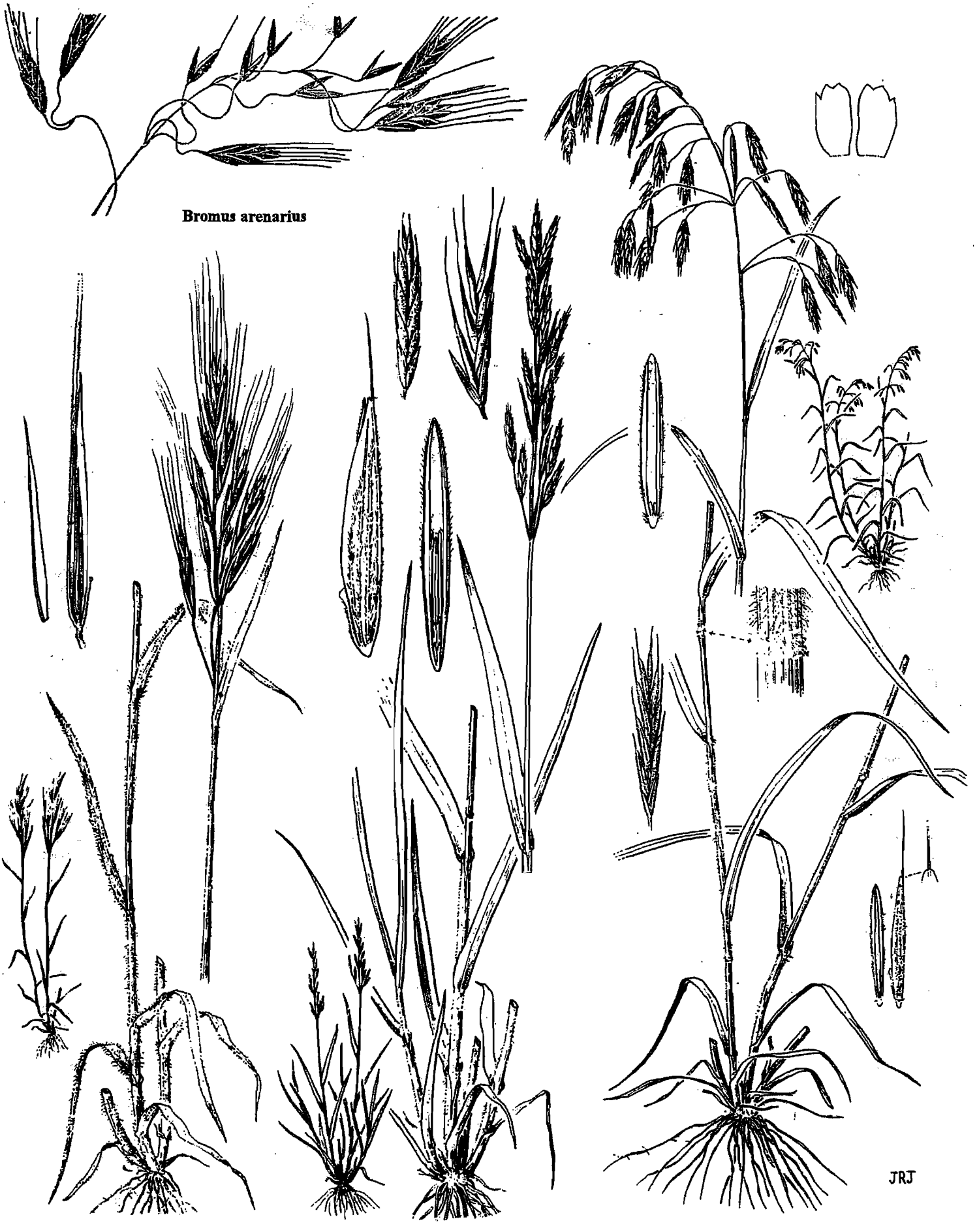
***Bromus diandrus** Roth [traditionally mistaken for *B. rigidus* Roth]. RIPGUT GRASS, DEVIL GRASS, BRONCO GRASS, NEEDLE BROME (p. 204). *HABIT*: annual herbs with culms ranging from about 3 to 8 dm. (12-32") tall. *BLADES*: fairly remote and about 2.5 to 5 dm. long and 2 to 10 mm. wide. *INFLORESCENCE*: an open panicle with upwardly ascending branches; the branches tend to nod to one side due to the weight of the maturing spikelets. *SPIKELETS*: about 3 to 4 cm. long and five to eight flowered, the lower glume is about 12 to 25 mm. long and the upper glume is about 18 to 30 mm. long. *LEMMA*: slender and about 2.5 to 3 cm. long, and terminating with a stiff awn about 3.5 to 5 cm. long. *OCCURRENCE*: widespread and locally common to abundant in open or semi-open habitats in the Tassajara region, and especially abundant in the vicinity of the hot springs. *DISTRIBUTION*: a common weed in western North America, native to Eurasia. *NOTE*: as implied by the names "Ripgut Grass" and "Devil Grass," this species becomes unpalatable to grazing animals upon the maturation of the long-awned lemmas. The lemmas also readily penetrate deep into fur or clothing, and can become lodged into ear canals or nasal passages. ⊛April-May.

Bromus grandis (Shear) Hitchcock. GRAND BROME (p. 204). *HABIT*: tufted perennial herbs with culms ranging from about 9 to 15 dm. (3-5') tall. *BLADES*: flat and ranging from about 1.5 to 4 dm. long and 5 to 12 mm. wide. *INFLORESCENCE*: the spikelets hang more or less pendulously on the slender and usually wavy branches of an open, spreading and ultimately nodding panicle about 1 to 2 dm. long. *SPIKELETS*: about 2 to 2.5 cm. long and mostly seven to nine flowered. The glumes are pubescent, the lower is about 4 to 7 mm. long and generally three-veined, while the upper glume is about 7 to 9 mm. long and three or sometimes five veined. *LEMMA*: linear-oblong and about 11 to 14 mm. long, and terminated with an awn about 3 to 6 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, primarily in semi-shady woodland habitats. *DISTRIBUTION*: Coast Ranges, Sierra Foothills, Transverse and Peninsular Ranges, from Santa Clara and Tuolumne Counties to northern Baja California, mostly between 1,300 and 7,500 ft. ⊛ May-June.

***Bromus hordeaceus** Linnaeus [*B. mollis* Linnaeus]. SOFT CHESS (p. 205). *HABIT*: annual herbs with culms ranging from about 1 to 7 dm. (4-36") tall. Plants growing in favorable habitats tend to be rather tall and produce large and densely floriferous panicles, while plants growing in unfavorable habitats can be quite depauperate (often less than 1 dm. [4"] tall), and with panicles comprised of only one to several small spikelets. *BLADES*: mostly about 4 to 16 cm. long and 1 to 5 mm. wide. *INFLORESCENCE*: generally head-like panicles with short and upwardly contracted branches; the panicles are about 1 to 10 cm. long. *SPIKELETS*: about 1 to 2 cm. long, generally oblong-elliptical in outline, and 5 to 10 flowered. The glumes are about 5 to 9 mm. long, with the lower glume averaging about 1 mm. shorter than the upper glume. *LEMMA*: about 6.5 to 10 mm. long, more or less rounded at both ends, and terminating with a fairly limber awn about 4 to 10 mm. long. *OCCURRENCE*: one of the most common grass species in open grassland habitats in the Tassajara region. *DISTRIBUTION*: a common weed in North America, particularly on the Pacific Slope; native to Eurasia. ⊛April-May.

Bromus laevipes Shear [*B. pseudolaevipes* Wagnon, *B. vulgaris* (Hooker) Shear var. *eximius* Shear]. WOODLAND BROME, CHINOOK BROME (p. 205). *HABIT*: tufted perennial herbs with culms ranging from about 6 to 15 dm. (2-5') tall. *BLADES*: about 1 to 4 dm. long and 4 to 10 mm. wide. *INFLORESCENCE*: the spikelets hang more or less pendulously on the slender and often wavy branches of an open, spreading and ultimately nodding panicle about 1 to 2.5 dm. long. *SPIKELETS*: about 2.5 to 3.5 cm. long and with five to eleven lemmas, the lower glume is about 4 to 9 mm. long and three-veined, while the upper glume is about 6 to 11 mm. long and five to seven veined. *LEMMA*: about 12 to 15 mm. long and terminated by an awn about 4 to 6 mm. long. *OCCURRENCE*: widespread in the Tassajara region, and locally common in more or less open and grassy woodland habitats. *DISTRIBUTION*: Cascades, Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Washington to northern Baja California. Also on some of the islands off the coast of southern California. *NOTE*: plants with ligules no more than 1 mm. long, pubescent blades, and glumes with scattered hairs are referable to what was recognized by Wagnon as *B. pseudolaevipes*. ⊛April-June.

***Bromus madritensis** Linnaeus subsp. **rubens** (Linnaeus) Husnot [*B. rubens* Linnaeus]. RED BROME, FOXTAIL BROME (p. 205). *HABIT*: relatively short annual herbs with culms ranging from about 1 to 5 dm. (4-20") tall. *BLADES*: generally remote (except at the base of more robust plants), and about 2 to 14 cm. long and 1 to 5 mm. wide. *INFLORESCENCE*: a shortly branched, head-like and commonly reddish-tinged panicle about 2 to 8 cm. long. *SPIKELETS*: about 2.5 cm. long and with seven to eleven lemmas, the lower glume is about 7 to 11 mm. long, and the upper glume is about 10 to 12 mm. long. *LEMMA*: nar-

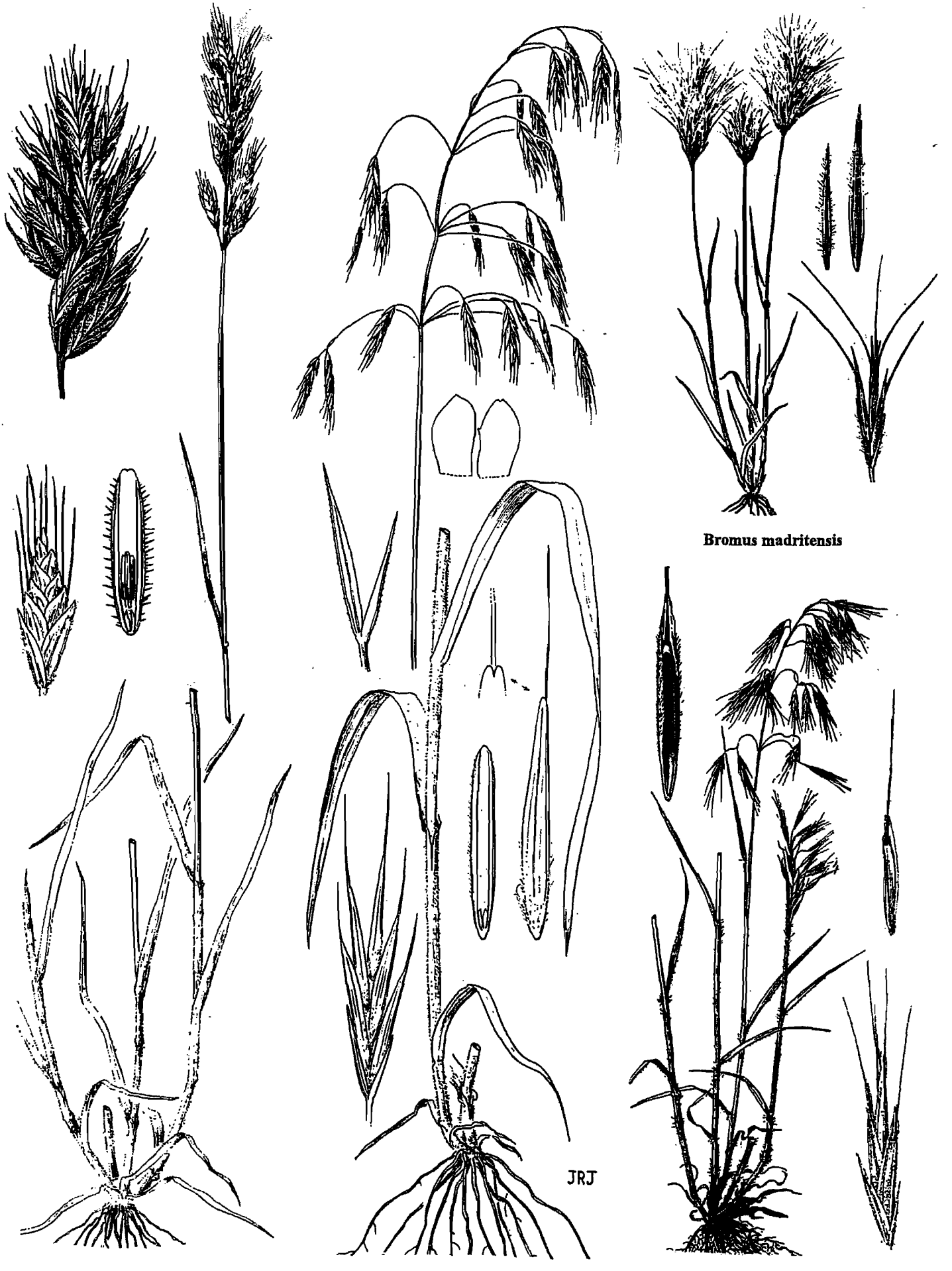


Bromus arenarius

Bromus diandrus

Bromus carinatus

Bromus grandis



Bromus madritensis

Bromus hordeaceus

Bromus laevipes

Bromus tectorum

rowly lanceolate, about 12 to 16 mm. long, and terminated by a stiff awn about 18 to 22 mm. long. *Occurrence*: widely scattered in the Tassajara region, especially in open areas with poor soils where there is little competition from other grasses or herbs. *Distribution*: a common weed in western North America; native of Eurasia. ⊛ April-May.

Bromus orcuttianus Vasey [*B. o.* var. *hallii* Hitchcock]. MOUNTAIN BROME (p. 207). *Habit*: tufted perennial herbs with culms ranging from about 6 to 16 dm. (24-64") tall. *Blades*: mostly basal and about 5 to 11 mm. wide. *Inflorescence*: an erect and generally pyramidal panicle about 8 to 17 cm. long, with rather stiff and upwardly ascending to spreading branches, the lower typically at right angles to the axis of the panicle. *Spikelets*: about 2 cm. long and with five to eight lemmas, the lower glume is about 6 to 8 mm. long with an acute apex and one (or faintly three) veined, while the upper glume is about 8 to 10 mm. long, broader and generally obtuse at the apex, and three-veined. *Lemma*: narrow and about 10 to 12 mm. long, and terminating with an awn about 5 to 7 mm. long. *Occurrence*: widely scattered in the Tassajara region, primarily in partly shady woodland habitats at higher elevations. *Distribution*: Cascades, Sierra Nevada, Coast, Transverse and Peninsular Ranges, from Washington to northern Baja California. Although this species usually occurs in areas between about 3,000 to 9,500 ft. in elevation, plants in this region are sometimes found as low as 1,000 ft. ⊛April-June.

***Bromus tectorum** Linnaeus. DOWNY CHESS, CHEAT GRASS (p. 205). *Habit*: annual herbs with slender culms ranging from about 2 to 5 dm. (8-20") tall. *Blades*: mostly basal and about 2 to 12 cm. long and 1 to 4 mm. wide. *Inflorescence*: open panicles with very slender, wavy and typically drooping branches on which the spikelets hang in a fairly pendulous manner. *Spikelets*: three to seven flowered, the glumes are about 5 to 12 mm. long, and the lower glume is about 2 to 4 mm. shorter than the upper glume. *Lemma*: about 9 to 13 mm. long and terminating with a slender awn about 8 to 18 mm. long. *Occurrence*: locally common in grasslands or grassy openings in chaparral on Chew's Ridge, along the Pine Ridge Trail from the first summit west of Tassajara Rd. to about halfway to the Church Creek Divide, along the spine of Black Butte Ridge, and in savannas on alluvial terraces above Tassajara Creek northeast of the confluence of Blackberry Creek. *Distribution*: a common weed in North America, native to Eurasia. ⊛May-June.

CALAMAGROSTIS. REED-GRASS.

About 100 species primarily of cooler temperate regions, and especially of moist habitats in mountainous areas.

Calamagrosits rubescens Buckley. PINE GRASS (p. 207). *Habit*: perennial herbs with slender culms ranging from about 6 to 10 dm. (24-40") tall. *Blades*: flat and about 2 to 5 mm. wide. *Inflorescence*: an upwardly contracted panicle about 6 to 25 cm. long. *Spikelets*: one flowered, the glumes are about 4 to 5 mm. long and about equal in length. *Lemma*: about 3 to 4 mm. long and awned from near base of the back side; the awn is about 3.5 to 4.5 mm. long and strongly twisted or bent. *Occurrence*: scattered in wet habitats on Chew's Ridge, and, according to Griffin ('75), also on Pine Ridge. I suspect that more research during the late summer months will reveal that this species is more widely distributed in this region. *Distribution*: from British Columbia to Colorado and the Coast Ranges of California, as far south as the Santa Lucia Mts. of Monterey Co., with a disjunct population on Santa Cruz Island (Santa Barbara Co.). ⊛June-Sept.

CYNODON.

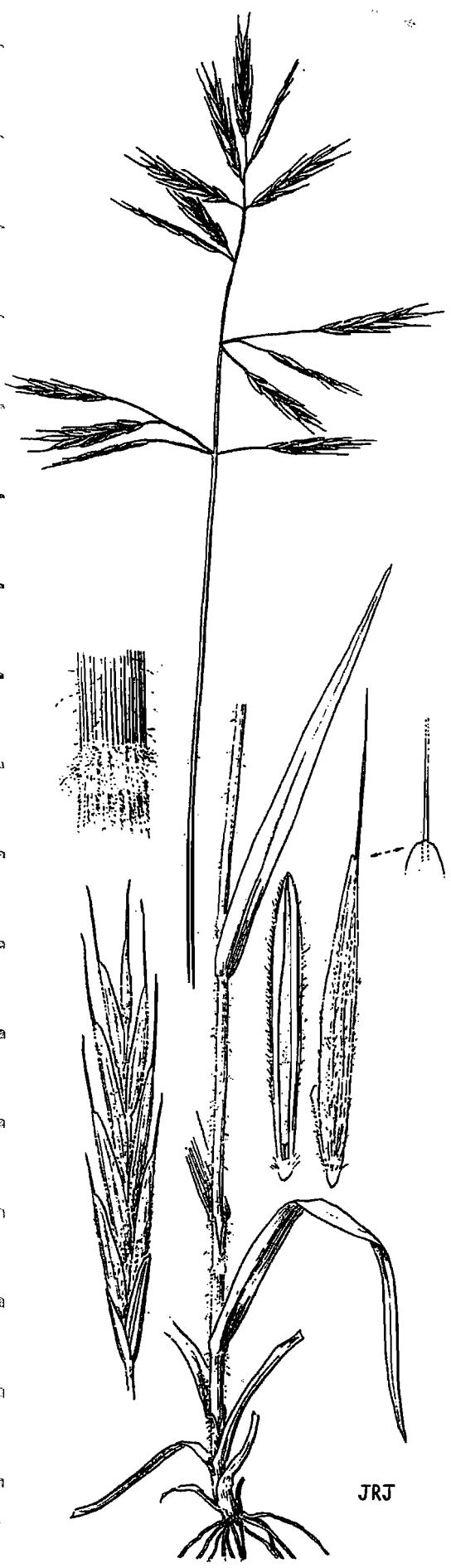
About 8 to 10 species native to tropical and warmer temperate regions of Eurasia and Africa.

***Cynodon dactylon** (Linnaeus) Persoon. BERMUDA GRASS (p. 207). *Habit*: deciduous perennials with flattened and wiry culms ranging from about 1 to 4 dm. (4-16") long. The culms arise from procumbent stolons. *Blades*: numerous, flat, and mostly less than 7 cm. long. *Inflorescence*: panicles which are palmately divided into slender spikes; the spikelets are produced in two overlapping rows on the upper axis. *Spikelets*: about 2 mm. long, one-flowered, and with glumes about 1.5 mm. long. *Lemma*: sharply keeled and about 2 mm. long. *Occurrence*: a major component of the lawns at Tassajara Hot Springs, and naturalized in the old streambed depression in The Flats (the site of new bath house), and occasionally in the bed of Tassajara Creek downstream from the hot springs. *Distribution*: a common lawn grass and a weed in generally moist places in the tropical and warmer-temperate regions of the Western Hemisphere; native to Africa. ⊛June-Aug.

DACTYLIS. ORCHARD-GRASS.

One species.

***Dactylis glomerata** Linnaeus (p. 207). *Habit*: tufted perennial herbs with culms ranging from about 4 to 15 dm. (16-60") tall. *Blades*: flat and about 6 to 40 cm. long and 2 to 8 mm. wide. *Inflorescence*: a generally open panicle about 1 to 1.5 dm. long, the short branches are rather stiff and erect to spreading, and terminated by dense clusters of spikelets. *Spikelets*: two to four flowered, the glumes are about 3 to 6 mm. long and nearly equal in length. *Lemma*: about 5 to 6 mm. long and terminated by a very short awn or awn-like formation. *Occurrence*: scattered along the Pine Ridge Trail between Tassajara Road and the Church Creek Divide, and in Pine Valley. *Distribution*: widespread in temperate North America; native to Eurasia. *Note*: this species is almost certainly of recent introduction in this region, for although I have hiked the Pine Ridge Trail many times, I did not notice this highly conspicuous species until July of 1990, when a few plants were encountered near the first summit west of Tassajara Road. By May of 1992 plants were fairly regularly encountered westward along the trail nearly all the way to the Church Creek Divide, and in May of 1993 the first plants were found in Pine Valley. This species was not listed by Griffin ('75). The most likely means of introduction is by undigested grains within horse manure. ⊛May-Aug.



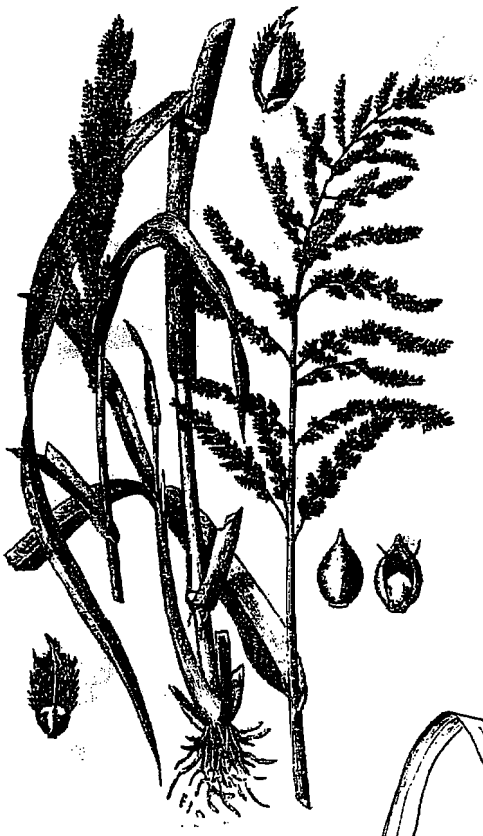
Bromus orcuttianus

Calamagrosits rubescens

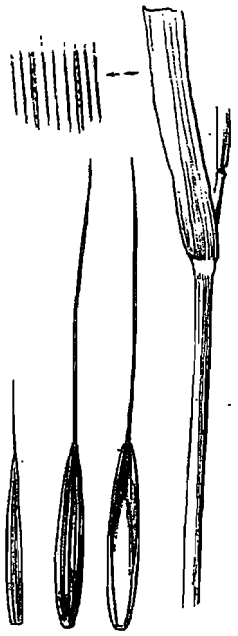
Dactylis glomerata

Cynodon dactylon

Deschampsia elongata

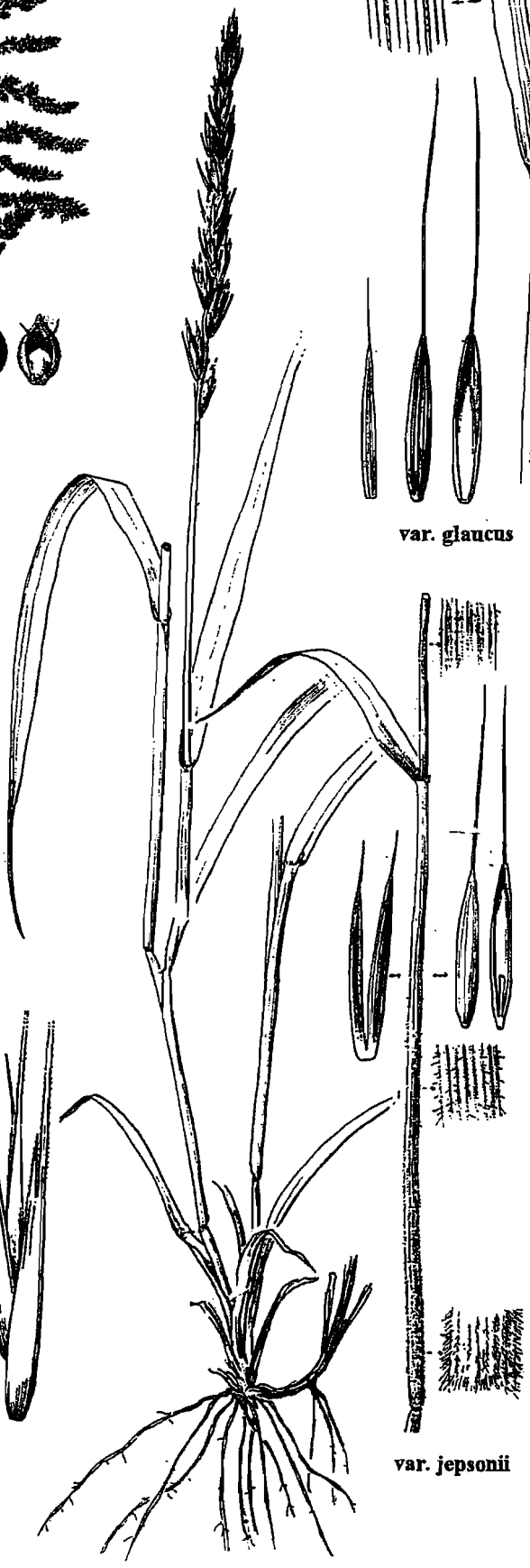


Echinochloa crus-galli



var. glaucus

Elymus multisetus



var. jepsonii

Elymus glaucus

Elymus stebbinsii

DESCHAMPSIA. HAIR-GRASS.

About 30 to 40 species of temperate regions of the Americas, Eurasia and New Zealand. Also represented in Antarctica.

Deschampsia elongata (Hooker) Bentham. SLENDER HAIR-GRASS (p. 207). *HABIT*: densely tufted perennial herbs with culms ranging from about 3 to 10 dm. (12-40") tall. *BLADES*: mostly basal, flat or involute, and about 4 to 8 cm. long and 1 mm. wide. *INFLORESCENCE*: a narrow and upwardly contracted panicle about 1 to 3 dm. long. *SPIKELETS*: one to three-flowered, the glumes are about 3 to 5 mm. long, and equaling to slightly exceeding the lemmas. *LEMMA*: about 2 to 3 mm. long, with a generally straight awn about 1 to 5 mm. long which originates from about the middle of back side. *OCCURRENCE*: according to Griffin ('75), this species is scattered in wet habitats on both Chew's and Pine Ridges. I suspect that more field research will reveal that this species is more widely scattered in this region. *DISTRIBUTION*: widespread in western North America, from Alaska to Wyoming, Arizona, and northern Baja California. Also native to temperate South America. ⊛May-Aug.

ECHINOCHLOA.

About 35 species of tropical to warmer-temperate regions.

***Echinochloa crus-galli** (Linnaeus) Beauvois. BARNYARD GRASS (p. 208). *HABIT*: hardy annual herbs with stout culms ranging from about 3 to 10 dm. (12-40") tall. *BLADES*: about 1 to 30 cm. long and 5 to 20 mm. wide. *INFLORESCENCE*: an erect or nodding panicle about 6 to 10 cm. long; the branches are densely floriferous and upwardly appressed to loosely ascending. *SPIKELETS*: about 3 to 4 mm. long, the lower glume is about 1 to 1.5 mm. long, while the upper glume is about 3 to 4 mm. long and terminating with a stout awn generally longer than the spikelet. *LEMMA*: about 3 mm. long. *OCCURRENCE*: lightly scattered in streambeds in the vicinity of Tassajara Hot Springs, such as along Horse Pasture Creek in and below the Horse Pasture, along Cabarga Creek below The Pines, and along Tassajara Creek downstream from the hot springs. *DISTRIBUTION*: a common weed in wet or moist habitats; native to Eurasia. ⊛July-Oct.

ELYMUS. WILD-RYE.

About 150 species of temperate regions worldwide.

1a. Glumes divided at the base into three to five awns. . . . . ***E. multisetus***.
1b. Glumes not divided, awns, if present, are singular and terminal:
2a. Spikelets singular at each node. . . . . ***E. stebbinsii***.
2b. Spikelets two or more at most or all of the nodes:
3a. Rachis readily disarticulating (falling apart) at the nodes in maturity. Glumes long awned. . . . . ***E. multisetus* X *glaucus***.
3b. Rachis not readily disarticulating in maturity. Glumes awnless or with an awn less than 6 mm. long:
4a. Leaf sheaths smooth to rough but not hairy. . . . . ***E. glaucus***.
4b. Leaf sheaths sparsely to densely hairy. . . . . ***E. glaucus*** subsp. ***jepsonii***.

Elymus glaucus Buckley. BLUE WILDRYE, WESTERN RYE-GRASS (p. 208). *HABIT*: loosely to densely tufted perennial herbs with culms ranging from about 6 to 15 dm. (2-5') tall. *BLADES*: about .5 to 3 dm. long and 4 to 12 mm. wide. *INFLORESCENCE*: a narrow and erect or slightly nodding spike about .5 to 2 dm. long. *SPIKELETS*: sessile, two to six-flowered, and mostly about 10 to 14 mm. long. The glumes are about 7 to 15 mm. long and terminate with a short awn. *LEMMAS*: about 8 to 14 mm. long and terminating with a slender awn up to 3 cm. long. *OCCURRENCE*: widespread and locally common in the Tassajara region, primarily in open and grassy woodland habitats and in openings in chaparral. *DISTRIBUTION*: western North America, from Alaska to northern Mexico. ⊛May-Aug.

Elymus glaucus subsp. **jepsonii** (Burtt Davy) Gould (p. 208). *HABIT*: like the typical species, except for the sheaths being sparsely to densely hairy. *OCCURRENCE*: scattered at higher elevations in the Tassajara region, but uncommon. I have seen this taxon along the Pine Ridge Trail between China Camp and the Church Creek Divide, and on Chew's Ridge between the lookout and the MIRA Observatory. Beatrice Howitt collected a specimen "by side of [Tassajara] road beyond China Camp on way to Tassajara" in May of 1970 (Howitt #3155), and according to James Griffin ('75), Steven Talley once collected a specimen on Pine Ridge. *DISTRIBUTION*: mostly in coniferous forests above about 3,000 ft., from British Columbia to northern Baja California and eastward to the Rocky Mountains. ⊛May-Aug.

Elymus multisetus (Smith) Burtt Davy [*Sitanion jubatum* Smith]. BIG SQUIRREL-TAIL (p. 208). *HABIT*: tufted perennial herbs with culms ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: commonly involute and about 3 to 20 cm. long and 1 to 5 mm. wide. *INFLORESCENCE*: distinctive head-like spikes about 3 to 17 cm. long, with the spikelets at first erect but ascending to widely spreading in maturity, and readily disarticulating (separating) at the nodes when disturbed. *SPIKELETS*: sessile and about 8 to 10 mm. long (excluding the awns), and the glumes are divided at the base into three to five awns about 2 to 8+ cm. long. *LEMMA*: slender and about 7 to 10 mm. long, with a terminal awn up to 10 cm. long, and often with a second awn up to half the length of the primary awn. *OCCURRENCE*: widely scattered in open and usually rocky habitats in Tassajara region, but generally uncommon. *DISTRIBUTION*: western North America, from Washington and Utah to northern Baja California and Arizona. ⊛May-July.

Elymus multisetus X **glaucus** [*Sitanion hansenii* (Scribner) Smith]. Sterile hybrids between *E. multisetus* and *E. glaucus*. *OCCURRENCE*: widely scattered in open and generally rocky habitats the Tassajara region, but not common.

Elymus stebbinsii Gould [*Agropyron parishii* Scribner & Smith, *A. p.* var. *laeve* S. & S.]. CALIFORNIA WHEATGRASS (p. 208). *HABIT*: loosely tufted evergreen perennial herbs with culms ranging from about 6 to 12 dm. (2-4') tall. *BLADES*: about 1 to 3 dm. long and 2 to 6 mm. wide. *INFLORESCENCE*: a narrow and typically upwardly nodding spike about 1 to 2.5 dm. long. *SPIKELETS*: sessile and arranged alternately at the nodes, about 12 to 20 mm. long and four to seven flowered; the glumes are slender, nearly equal, about 10 to 15 mm. long, and gradually taper to an awn usually less than 6 mm. long. *LEMMA*: about 8 to 12 mm. long and terminated by a slender awn about 1 to 2.5 cm. long. *OCCURRENCE*: widely scattered and locally common in grassy areas within shady or semi-shady woodlands in the Tassajara region. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges. ⊛May-July.

FESTUCA. FESCUE.

Approximately 65 species of temperate and boreal regions.

1a. Leaf sheath closed. Panicle with upwardly ascending branches. Lemma awn terminal. . . . . ***F. rubra.***
1b. Leaf sheath open. Panicle with ascending to spreading and often drooping branches. Lemma awn subterminal from between two short teeth. . . . . ***F. elmeri.***

Festuca elmeri Scribner & Merrill. BROME FESCUE (p. 211). *HABIT*: loosely tufted perennial herbs with slender culms ranging from about 4 to 10 dm. (16-40") tall. *BLADES*: about 1 to 4 dm. long and 2 to 6 mm. wide, and flat to slightly involute. *INFLORESCENCE*: an open panicle about 10 to 20 cm. long; the branches are ascending to widely spreading and more or less drooping, and the lower-most branches are up to 1 dm. long. *SPIKELETS*: about 7 to 11 mm. long and with two to six lemmas, the lower glume is about 2 to 4 mm. long and the upper glume is about 3 to 4.5 mm. long. *LEMMA*: about 5.5 to 7 mm. long, generally narrowly oblong with an acute apex, and with a slender awn about 2 to 5 mm. long. *OCCURRENCE*: uncommon in shady habitats along the Horse Pasture Trail between Tassajara Road and the Horse Pasture. Although I have not seen this species elsewhere in this region, it is certainly more widely distributed, for it was collected in Pine Valley by A. D. E. Elmer in June of 1901 (Elmer #3322 DS). *DISTRIBUTION*: Coast Ranges from southwestern Oregon to San Luis Obispo Co. *NOTE*: the type specimen, which was also collected by (and named for) Mr. Elmer, is from the campus of Stanford University. ⊛May-June.

Festuca rubra Linnaeus. RED FESCUE (p. 211). *HABIT*: loosely-tufted perennial herbs with culms ranging from about 4 to 10 dm. (12-40") tall. The culms typically have decumbent and reddish to purplish tinged bases. *BLADES*: about .5 to 3 dm. long, usually involute, and less than 3 mm. wide. *INFLORESCENCE*: a fairly open panicle about .5 to 2 dm. long comprised of upwardly ascending branches. *SPIKELETS*: about 9 to 12 mm. long and with three to ten lemmas, the lower glume is about 2.5 to 3.5 mm. long and the upper glume is about 3.5 to 5.5 mm. long. *LEMMA*: about 5 to 7 mm. long, narrowly oblong with an acute apex, and terminated by a slender awn about 2 to 4 mm. long. *OCCURRENCE*: scattered in shady and/or moist or seasonally moist habitats in the Tassajara region, but generally uncommon. *DISTRIBUTION*: widely distributed in the northern temperate regions of Eurasia and North America. On the Pacific Slope the species extends southward in the Coast Ranges to the Santa Lucia Mts. of San Luis Obispo Co., and to the southern Sierra Nevada, with a disjunct population in the San Bernardino Mts. ⊛May-July.

GASTRIDIUM. NITGRASS.

Two species of warmer-temperate Europe and western Asia.

***Gastridium ventricosum** (Gouan) Schinz & Thellung (p. 211). *HABIT*: annual herbs with slender culms ranging from about 1 to 5 dm. (4-20") tall. *BLADES*: narrowly linear, remote (except for basal leaves), about 2 to 12 cm. long and up to 3 mm. wide. *INFLORESCENCE*: a narrow and tightly compacted head-like panicle about 3 to 8 cm. long. The panicles exhibit a sheen due to the glossy glumes. *SPIKELETS*: one-flowered; the glumes are about 3 mm. long and enclose the lemma in a sack-like base. *LEMMA*: about 1 mm. long and with an awn about 5 mm. long; the awn originates from near the top of the back side. *OCCURRENCE*: lightly scattered in open grasslands in the Horse Pasture and The Pines. *DISTRIBUTION*: a fairly common weed on the Pacific Slope of temperate North America; native to Eurasia. *NOTE*: this species has been present in this region for at least 97 years, for it was collected in the vicinity of Tassajara Hot Springs by A. D. E. Elmer in June of 1901 (Elmer #3320 DS). ⊛May-June.

HORDEUM. BARLEY.

About 32 species of annual and perennial herbs of temperate regions nearly worldwide. The domestic barley is *Hordeum vulgare*.

1a. Perennial herbs of wet or seasonally wet habitats. . . . . ***H. brachyantherum.***
1b. Annual herbs of mostly dry habitats.
2a. Glumes not ciliate. . . . . ***H. marinum.***
2b. Glumes ciliate on the margins (or at least on the margins of the central spikelet and inner glumes of the lateral spikelets). . . . . ***H. murinum.***

Hordeum brachyantherum Nevski subsp. **californicum** (Covas & Stebbins) Bothmer, Jacobsen & Seberg. CALIFORNIA BARLEY (p. 211). *HABIT*: tufted perennial herbs with culms ranging from about 2 to 6.5 dm. tall. *BLADES*: flat, less than 11 cm. long, and about 1.5 to 3.5 mm. wide. *INFLORESCENCE*: terminal and commonly purplish-tinged spikes about 2.5 to 8 cm. long. *SPIKELETS*: produced in groups of three's; the glumes are awn-like and about 6.5 to 19 mm. long. *LEMMA*: lemmas of central spikelets are about 5.5 to 10 mm. long and terminated by an awn up to 7.5 mm. long, while the reduced lemmas of lateral spikelets are less than 7 mm. long and with an awn less than 7 mm. long. *OCCURRENCE*: scattered in open and seasonally wet or moist habitats in Pine Valley, and according to Griffin ('75), rare on Chew's Ridge. Plants in Strawberry Valley that were observed before the development of panicles probably represent this species. *DISTRIBUTION*: widely distributed in the California Floristic Province, from southern Oregon to southern California. ⊛April-Aug.

***Hordeum marinum** Hudson subsp. **gussoneanum** (Parlatore) Thellung [*H. hystrix* Roth, *H. geniculatum* Allioni]. MEDITERRANEAN BARLEY (p. 211). *HABIT*: annual herbs with culms ranging from about 1 to 4 dm. (4-16") tall. *BLADES*: flat, relatively short, and about 1 to 5 mm. wide. *INFLORESCENCE*: densely flowered head-like spikes about 1.5 to 7 cm. long. *SPIKELETS*: produced in groups of three's; the awn-like glumes of the central spikelets are about 10 to 26 mm. long, while those of the lateral spikelets are about 2 to 4 mm. shorter. *LEMMA*: central spikelet lemmas are about 5 to 8 mm. long and terminated by an awn about 6 to 18 mm. long, while lateral spikelet lemmas are generally less than 5 mm. long and terminated by an awn about 3 to 8 mm. long. *OCCURRENCE*: locally common in open grassy areas from the Church Creek region to Pine Valley, but rare to absent in most of the Tassajara region. *DISTRIBUTION*: a common weed in western North America, native to Eurasia. ⊛April-June.

***Hordeum murinum** Linnaeus subsp. **leporinum** (Link) Arcangeli [*H. leporinum* Link]. WILD BARLEY, FOXTAIL BARLEY (p. 212). *HABIT*: annual herbs with culms ranging from about 1 to 6 dm (4-24") tall. *BLADES*: flat, relatively short, and about 1 to 5 mm. wide. *INFLORESCENCE*: dense and bristly-awned head-like spikes about 3 to 8 cm. long. *SPIKELETS*:

Festuca elmeri

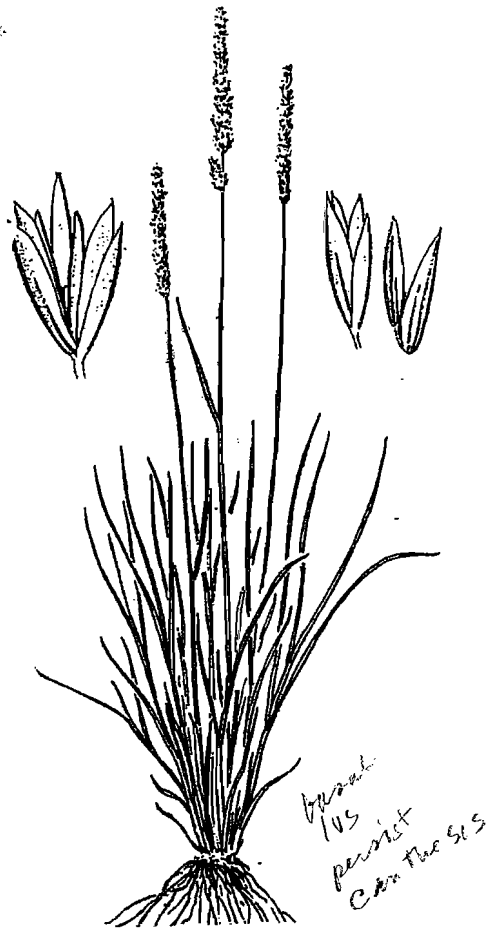
Hordeum brachyantherum californicum

Gastridium ventricosum

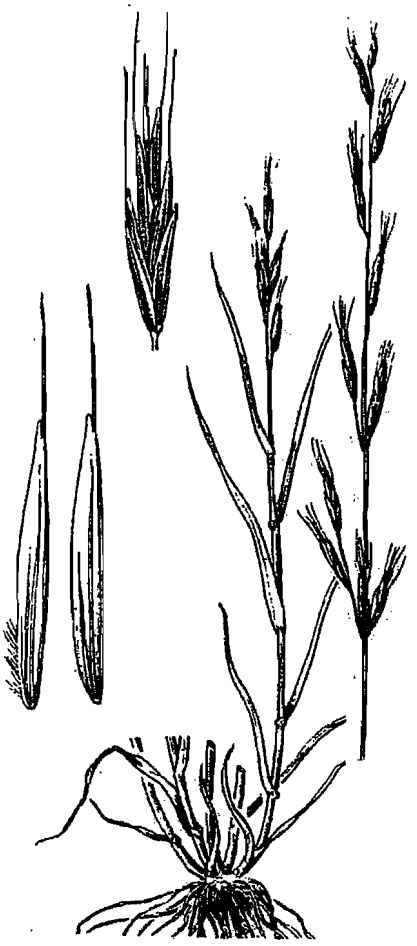
Festuca rubra

Hordeum marinum gussoneanum

Hordeum murinum leporinum



Koeleria macrantha



Melica aristata

Lolium multiflorum

Leymus triticoides

Melica californica

produced in groups of three's; the awn-like glumes of the central spikelets are about 11 to 35 mm. long, while those of the lateral spikelets up to 10 mm. longer. *LEMMA*: about 8 to 15 mm. long and terminated by an awn about 2 to 5 cm. long. *OCCURRENCE*: weedy around the developed area of Tassajara Hot Springs and occasionally along Tassajara Road, along trails, and at campsites. *DISTRIBUTION*: a common weed in western North America, native to the Mediterranean region. ⊛April-May.

KOELERIA.

About 30 species of temperate Eurasia and North America.

Koeleria macrantha (Ledebour) Schultes [*K. cristata* (Linnaeus) Persoon illegitimate]. JUNE GRASS (p. 212). *HABIT*: densely tufted perennial herbs with slender culms ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: primarily basal, flat or involute, about 3 to 20 cm. long and 1 to 3 mm. wide. *INFLORESCENCE*: a narrow and upwardly contracted panicle about 2 to 15 cm. long. *SPIKELETS*: about 4 to 6 mm. long and two to four flowered; the lower glumes are about 3 mm. long and the upper glumes are about 5 mm. long. *LEMMA*: about 3 to 4 mm. long and awnless or with a very short awn-like tip. *OCCURRENCE*: widely scattered and fairly common in open grasslands and sometimes semi-open woodland habitats in the Tassajara region. *DISTRIBUTION*: temperate North America, from Alaska and eastern Canada to northern Mexico. *NOTE*: this species can be exceedingly long lived, and in a pattern similar to the growth of rings on trees, new growth is annually produced at the outer parameters, a process that can continue for many years after the original tuft has expired. ⊛May-July.

LEYMUS. CREEPING WILD-RYE.

About 31 species of North America and Eurasia. The name is an anagram of *Elymus*, from which it has been segregated.

Leymus triticoides (Buckley) Pilger [*Elymus t.* Buckley]. VALLEY WILD-RYE, BEARDLESS WILD-RYE (p. 212). *HABIT*: rhizomatic perennial herbs with culms ranging from about 5 to 12 dm. (20-48") tall. *BLADES*: flat or involute and about 2 to 5 mm. wide. *INFLORESCENCE*: a narrow spike about 5 to 20 cm. long, with one to three spikelets at each node. *SPIKELETS*: two to seven flowered, the glumes awl-like and about 5 to 16 mm. long, and often with a short-awned tip. *LEMMA*: about 5 to 12 mm. long and acute to shortly awned. *OCCURRENCE*: plants most probably representing this species (but observed when not in flower or fruit) are scattered in open and seasonally wet habitats in Pine Valley and Strawberry Valley. According to a note enclosed in an envelope pasted to the sheet of A. D. E. Elmer's "Tassajara Hot Springs" specimen of June 1901 (Elmer #3312 DS,) Elmer collected it at "Church's place, not abundant." *DISTRIBUTION*: widely distributed in temperate western North America, mostly in more or less moist and often alkaline habitats, from Washington and Montana to northern Baja California and Texas. ⊛June-July.

LOLIUM. RYE-GRASS, DARNEL.

About eight species of Eurasia.

***Lolium multiflorum** Lamarck. ITALIAN RYE-GRASS, ANNUAL RYE-GRASS (p. 212). *HABIT*: annual or biennial herbs with erect or ascending culms ranging from about 4 to 10 dm. (16-40') tall. *BLADES*: generally flat and about 5 to 20 cm. long and 3 to 7 mm. wide. *INFLORESCENCE*: terminal spikes about 1 to 3 dm. long, with the spikelets alternately arranged at the nodes. *SPIKELETS*: about 10 to 15 mm. long and about 10 to 20 flowered; the glumes are linear-lanceolate and about 5 to 9 mm. long. *LEMMA*: about 5 to 8 mm. long and terminating with an awn about 1 to 8 mm. long. *OCCURRENCE*: scattered throughout the Tassajara, mostly in shady or moist habitats. *DISTRIBUTION*: widespread in temperate North America; native to Eurasia. *NOTE*: this species was introduced into this region by the U. S. Forest Service as part of a reseeding program after the Marble-Cone Fire of 1977. The practice of "reseeding" is ill-conceived, especially in a wilderness area, for the introduction of an aggressive alien herb adds an unnecessary and perhaps detrimental element to the intense competition for re-establishment among native plants. The introduction of this species must have had some impact on the populations of the region's many "burn-species," i.e., annual herbs that thrive only in the first few years after a fire. ⊛ May-Aug.

MELICA. MELIC-GRASS, ONION-GRASS.

About 80 species of temperate regions in the northern and southern hemispheres.

1a. Lemmas awned:
2a. Awns 5 to 12 mm. long, lemma surface glabrous or hairy on the lower margins. . . . . ***M. aristata.***
2b. Awns less than 5 mm. long, lemma surface hairy towards the base. . . . . ***M. harfordii.***
1b. Lemmas not awned:
3a. Spikelets with mostly one 1 (or rarely 2) fertile lemmas, and a small imperfect (staminate) lemma. . . . . ***M. imperfecta.***
3b. Spikelets mostly with 2 to 5 fertile (grain-producing) lemmas:
4a. Sterile cluster at axis tip widest above middle, the tip truncate. . . . . ***M. californica.***
4b. Sterile cluster at axis tip widest below middle, the tip acute to acuminate. . . . . ***M. geyeri.***

⇕**Melica aristata** Thurber ex Bolander. AWNED MELIC (p. 212). *HABIT*: tufted evergreen perennial herbs with culms ranging from about 5 to 12 dm. (20-48") tall. *BLADES*: flat and about 3 to 6 mm. wide. *INFLORESCENCE*: about 10 to 23 cm. long, with the spikelets borne on relatively short and upwardly appressed to ascending branches. *SPIKELETS*: about 1 to 2 cm. long and with two to five lemmas, the glumes are about 7 to 12 mm. long, and the upper glume is generally ~~longer than the lower glume~~. *LEMMA*: ~~about 8 to 13 mm.~~ long ~~and~~ terminated by an awn about 5 to 12 mm. long. *OCCURRENCE*: scattered in shady woodland habitats at higher elevations in the Tassajara region, but uncommon. *DISTRIBUTION*: from Washington to the north Coast Ranges and Sierra Nevada of California, with disjunct populations in the Santa Lucia Mts. (Monterey and San Luis Obispo Counties) and the San Bernardino Mts. *NOTE*: the plants of this region are often unclearly differentiated from *M. harfordii*. ⊛June-August.

Melica californica Scribner. CALIFORNIA MELIC (p. 212). *HABIT*: tufted perennial herbs with culms ranging from about 6 to 12 dm.

(2-4') tall. *BLADES*: about 10 to 25 cm. long and 2 to 5 mm. wide. *INFLORESCENCE*: an upwardly contracted and fairly densely flowered panicle about .5 to 3 dm. long. *SPIKELETS*: about 5 to 15 mm. long and with two to five lemmas. The glumes are subequal and up to 12 mm. long. *LEMMA*: about 5 to 9 mm. long and obtuse or notched at the apex. *OCCURRENCE*: very lightly scattered in grassy areas in The Pines and in the Horse Pasture, and Griffin ('75) reported the species to be uncommon on Chew's Ridge. *DISTRIBUTION*: Coast Ranges, Sierra Nevada Foothills and western Transverse Ranges, from Oregon to Ventura Co. ⊛April-May.

⇩**Melica geyeri** Munro ex Bolander (p. 215). *HABIT*: tufted perennial herbs with culms ranging from about 8 to 20 dm. (32-80") tall. *BLADES*: flat and about 2 to 8 mm. wide. *INFLORESCENCE*: and open panicle about 1 to 2 dm. long; the branches are ascending to spreading. *SPIKELETS*: about 12 to 20 mm. long and with two to five lemmas, the lower glume is about 3.5 to 7 mm. long, and the upper glume is about 5.5 to 11 mm. long. *LEMMA*: about 8 to 11 mm. long. *OCCURRENCE*: rare in woodland areas from the upper regions of Church Creek to Pine Valley, and according to Griffin ('75), also rare on Chew's Ridge. *DISTRIBUTION*: from northern Oregon southward through the Coast Ranges to the Santa Lucia Mts. of San Luis Obispo Co. (one population was reported by Hoover, '70). Also in the Sierra Nevada, as far south as Kern Co., but rare. ⊛April-July.

⇩**Melica harfordii** Bolander (p. 215). *HABIT*: tufted evergreen perennial herbs with culms ranging from about 6 to 12 dm. (2-4') tall. *BLADES*: often widely spreading from the culms, and ranging from about 10 to 30 cm. long and about 2 to 6 mm. wide. *INFLORESCENCE*: an upwardly contracted panicle ranging from about 6 to 22 cm. long. *SPIKELETS*: about 7 to 20 mm. long and with two to six lemmas. *LEMMA*: 6 to 16 mm. long and terminating with an awn less than 4 mm. long. *OCCURRENCE*: widely scattered in shady woodland habitats in the Tassajara region, and fairly common in some areas. Occasionally plants are found in open and seasonally wet sites, such as in the beds of smaller streams. *DISTRIBUTION*: from British Columbia and Montana southward, along the Pacific Slope, to the Santa Lucia Mts. of San Luis Obispo County in the Coast Ranges, and to at least Yosemite National Park in the Sierra Nevada. ⊛May-June.

Melica imperfecta Trinius. COAST RANGE MELIC, CALIFORNIA MELIC, SMALL-FLOWERED MELIC (p. 215). *HABIT*: loosely to densely cespitose perennial herbs with culms ranging from about 1 to 12 dm. (1-4') tall. *BLADES*: primarily basal and ranging from about 10 to 30 cm. long and 1 to 6 mm. wide. *INFLORESCENCE*: a variable panicle about 5 to 35 cm. long, the branches, which are often whorled at the nodes, range from upwardly contracted to outwardly spreading or reflexed. *SPIKELETS*: about 3 to 6 mm. long and usually with one lemma. The glumes are nearly equal in length and tinged purplish-brown. *LEMMA*: about 3 to 7 mm. long and without an awn. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, mostly in fairly rocky areas in woodlands and in openings in chaparral. *DISTRIBUTION*: Coast Ranges, Sierra Nevada, Transverse and Peninsular Ranges, from Lake and El Dorado Counties northern Baja California. *NOTE*: the botanical name for this species refers to the conspicuous imperfect floret that is technically positioned above the lemma, but appears to be appressed to the inner side. ⊛April-May.

NASSELLA. NEEDLE-GRASS.

About 80 species of North and South America. Segregated from *Stipa*.

1a. Glumes ±1 mm. wide when pressed flat, and not purplish-brown. Lemmas less than 6.5 mm. long. Lemma awns very slender and flexuous, and less than 5 cm. long. . . . . ***N. lepida.***

1b. Glumes ±2+ mm. wide when pressed flat, and commonly purplish-brown. Lemmas about 6.5 to 12 mm. long. Lemma awns relatively stout and stiff, and usually more to much more than 5 cm. long. . . . . ***N. pulchra.***

Nassella lepida (A. Hitchcock) Barkworth [*Stipa l.* Hitchcock]. FOOTHILL NEEDLE-GRASS (p. 216). *HABIT*: often very densely tufted perennial bunch grasses with slender culms ranging from about 3 to 9 dm. (1-3') tall. *BLADES*: glaucus gray-green, about 10 to 25 cm. long and 1 to 3.5 mm. wide, and often appearing to be nearly filiform due the involute margins. *INFLORESCENCE*: whispy-looking panicles about .5 to 3 dm. long, the branches are erect to loosely ascending. *SPIKELETS*: one-flowered, the glumes are very slender and sharply acute, about 4 to 10 mm. long, and the lower glume is usually longer than the upper glume. *LEMMA*: about 4 to 6 mm. long, mostly less than 1 mm. wide, and terminating with a slender awn about 2 to 4.5 cm. long. *OCCURRENCE*: scattered in open grasslands and grassy areas in open woodlands at lower to intermediate elevations in the Tassajara region, but uncommon. For many years a well entrenched colony has been established at the summit of the trail over the Hog's Back. *DISTRIBUTION*: Coast, Transverse and Peninsular Ranges, from Humboldt County to northern Baja California. Also on the Channel Islands. *NOTE*: the lemma awns of this and the following taxon become twisted when dry and straight when moisture is applied, an adaptation which enables the awn to drill the lemma into the ground at the beginning of the rainy season. ⊛March-May

Nassella pulchra (A.S. Hitchcock) Barkworth [*Stipa p.* Hitchcock]. PURPLE NEEDLE-GRASS (p. 216). *HABIT*: tufted perennial herbs with slender culms ranging from about 6 to 10 dm. (24-40") tall. *BLADES*: about 8 to 30 cm. long and 1 to 3 mm. wide, and commonly appearing to be filiform due to involute margins. *INFLORESCENCE*: a typically nodding and often purplish-tinged panicle about 10 to 30 cm. long, with loosely ascending to spreading branches. *SPIKELETS*: one-flowered, the glumes are about 12 to 19 mm. long and about equal in length. *LEMMA*: about 6.5 to 10 mm. long and terminating with a twice-bent awn about 5 to 9 cm. long. *OCCURRENCE*: widely scattered in open grassland habitats at lower to intermediate elevations in the Tassajara region, and fairly common in some areas. *DISTRIBUTION*: Coast Ranges, Sacramento Valley, northern San Joaquin Valley, Sierra Nevada Foothills, Transverse and Peninsular Ranges, from Humboldt Co. to northern Baja California. *NOTE*: this species, the "State Grass" of California, is believed to have been abundant in the grassland habitats of much of northern and central California before the arrival of European settlers. ⊛April-June.

PANICUM. MILLET.

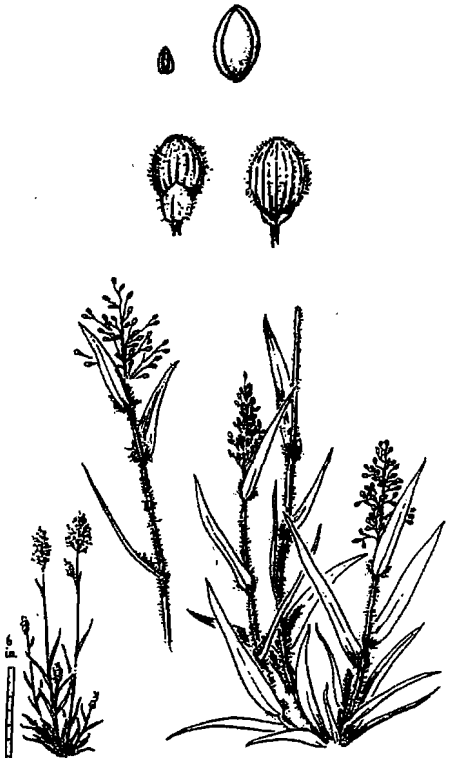
About 450 species of tropical and temperate regions.

Panicum acuminatum Swartz [*P. pacificum* Hitchcock & Chase]. PACIFIC MILLET, PACIFIC PANIC-GRASS (p. 216). *HABIT*: winter-deciduous perennial herbs with erect or spreading culms ranging from about 3 to 6 dm. long. Erect culms are generally produced in the spring, while spreading culms are generally produced in summer. *BLADES*: about 2 to 10 cm. long and 2 to 8 mm. wide, and produced in basal tufts as well as on the culms. *INFLORESCENCE*: open panicles about 3 to 10 cm. long; those of spreading culms often obscured by foliage. *SPIKE-*

Melica geyeri **Melica harfordii** **Melica imperfecta**

Nassella lepida

Nassella pulchra



Panicum acuminatum

Poa annua

LETS: roundish to obovate and about 1 to 2 mm. long, the first glume a minute bract and the second glume as large as the spikelet. *LEMMA*: about 1 to 2 mm. long and simulating a third glume. *OCCURRENCE*: scattered along perennial streams of the Tassajara region, and found in a number of situations, but most conspicuous in the cracks and crevices of streamside boulders and cliffs. *DISTRIBUTION*: widely distributed in North and South America. ⊛April-Oct.

POA. BLUEGRASS.

About 500 species of temperate regions.

1a. Annual grasses. Panicle branches mostly spreading. Back side of lemmas sharply creased:
2a. Culms mostly 2 to 9 dm. tall. Outside base of lemmas with cotton or cobweb-like tufts of hairs. . . . . ***P. howellii***.
2b. Culms mostly .5 to 3 dm. tall. Outside base of lemmas without tufts of hairs. . . . . ***P. annua***.
1b. Perennial bunch grasses. Panicle branches erect or loosely ascending. Back side of lemmas rounded (except for the mid-rib). . . . . ***P. secunda***.

***Poa annua** Linnaeus. ANNUAL BLUEGRASS, WINTERGRASS (p. 216). *HABIT*: annual herbs with erect or ascending culms ranging from about .5 to 3 dm. (2-12") tall. *BLADES*: about 1 to 10 cm. long and 1 to 5 mm. wide. *INFLORESCENCE*: an open panicle generally triangular in outline and about 1 to 10 cm. long. *SPIKELETS*: about 3 to 6 mm. long and with about three to six lemmas; the glumes are unequal in length and less than 4 mm. long. *LEMMA*: about 2.5 to 4 mm. long. *OCCURRENCE*: scattered in streambeds and other moist habitats in the Tassajara region, and weedy around the developed area of the hot springs. *DISTRIBUTION*: a common weed in North America; native to Eurasia.

Poa howellii Vasey & Scribner [*P. bolanderi* Vasey subsp. *h.* (Vasey & Scribner) Keck] (p. 219). *HABIT*: generally tufted annual herbs with culms ranging from about 2 to 9 dm. (8-36") tall. *BLADES*: mostly basal and ranging from about .5 to 7 dm. long and 1 to 4 mm. wide. *INFLORESCENCE*: an open panicle about 10 to 25 cm. long; the branches are ascending to spreading. *SPIKELETS*: about 3 to 5 mm. long and two to five flowered, the glumes are narrow and about 1.5 to 2 mm. long. *LEMMA*: about 3 mm. long and with a tuft of cobwebby hairs at the out-side base. *OCCURRENCE*: lightly scattered on shady woodland slopes and on rocky stream banks at lower to intermediate elevations in the Tassajara region. *DISTRIBUTION*: from British Columbia southward, through the Coast Ranges and mountains of southern California, to San Diego Co. Also in the Sierra Foothills, but apparently rare. ⊛ April-May.

Poa secunda Presl [*P. scabrella* (Thurber) Vasey]. PINE BLUEGRASS, MALPAIS BLUEGRASS, ONE-SIDED BLUEGRASS, MUTTON GRASS (p. 219). *HABIT*: usually densely cespitose perennial herbs with slender culms ranging from about 3 to 10 dm. (12-40") tall. *BLADES*: primarily basal and ranging from about 2 to 16 cm. long and 1 to 3 mm. wide. *INFLORESCENCE*: a fairly open to dense panicle about 5 to 20 cm. long, the branches are upwardly contracted to loosely ascending. *SPIKELETS*: about 6 to 10 mm. long and three to eight flowered, the glumes are about 2 to 5 mm. long, and the upper glume is slightly longer than the lower glume. *LEMMA*: about 4 to 5 mm. long. *OCCURRENCE*: widely scattered and locally common in most habitats types in the Tassajara region, except for deeply shady and/or wet areas. *DISTRIBUTION*: temperate North America, from Alaska and Quebec to northern Baja California and New Mexico. Also in South America. *NOTE*: many of the plants of this region approach the description of the closely related *P. tenerrima*. Such plants differ from the typical species in having smaller tufts, more slender and delicate culms, and open, spreading panicle branches. ⊛March-May.

POLYPOGON. BEARD-GRASS.

About 18 species of Eurasia, Africa and the Americas.

1a. Glume awns less than 5 mm. long. Panicles coarsely textured and variously lobed. . . . . ***P. interruptus***.
1b. Glume awns mostly more than 5 mm. long. Panicles with a soft, fur-like texture, and generally uniform and head-like. . . . . ***P. monspeliensis***.

***Polypogon interruptus** Humboldt, Bonpland & Kunth [*P. lutosus* (Poiret) Hitchcock]. DITCH BEARD-GRASS (p. 219). *HABIT*: often tufted perennial herbs generally with decumbent-ascending culms ranging from about 1 to 10 dm. (4-40") long. *BLADES*: generally flat and about 1 to 20 cm. long and 3 to 6 mm. wide. *INFLORESCENCE*: densely flowered and upwardly contracted panicles about 2 to 18 cm. long; the panicles are typically irregular in outline. *SPIKELETS*: one flowered, the glumes are about 1.5 to 3 mm. long, terminated by slender awns about 1.5 to 4.5 mm. long, and fall with the matured lemmas. *LEMMA*: about 1 to 2 mm. long and with an awn about .5 to 3 mm. long. *OCCURRENCE*: scattered in the beds of perennial and major intermittent streams in the Tassajara region. *DISTRIBUTION*: a common weed of wet or moist habitats in North America; native to South America. ⊛May-Aug.

***Polypogon monspeliensis** (Linnaeus) Desfontaines. RABBIT'S FOOT GRASS (p. 219). *HABIT*: annual herbs with culms ranging from about 1.5 to 5 dm. (6-20") tall. *BLADES*: generally flat and about 1 to 20 cm. long and 4 to 6 mm. wide. *INFLORESCENCE*: dense and upwardly contracted panicles about 1 to 17 cm. long. The panicles have a soft and fur-like texture. *SPIKELETS*: one flowered, the glumes are about 1 to 2.5 mm. long, terminated with slender awns about 2 to 10 mm. long, and fall with the matured lemmas. *LEMMA*: about .5 to 1.5 mm. long and with an awn about .5 to 4.5 mm. long. *OCCURRENCE*: lightly scattered along streams in the Tassajara region, and sometimes at springs and seeps. *DISTRIBUTION*: a common weed in moist places nearly worldwide; native to Europe. ⊛April-Aug.

VULPIA. ANNUAL FESCUE.

About 25 species of temperate and Mediterranean regions of Eurasia, North Africa and the Americas. Segregated from *Festuca*.

1a. First glume less than half the length of the second glume:
2a. Upper lemma margins ciliate (with fringe-like hairs). . . . . ***V. myuros*** var. ***hirsuta***.
2b. Upper lemma margins not ciliate. . . . . ***V. myuros*** var. ***myuros***.
1b. First glume more than half the length of the second glume:
3a. Panicle branches upwardly contracted; the lower branches without callus-like formations in the axils. . . . . ***V. bromoides***.

3b. At least the lower panicle branches spreading to reflexed downward; the lower branches with small callus-like formations in the axils:
4a. Lemmas glabrous:
5a. Glumes glabrous. . . . . ***V. microstachys* var. *pauciflora*.**
5b. Glumes pubescent. . . . . ***V. microstachys* var. *confusa*.**
4b. Lemmas pubescent:
6a. Glumes glabrous. . . . . ***V. microstachys* var. *microstachys*.**
6b. Glumes pubescent. . . . . ***V. microstachys* var. *ciliata*.**

***Vulpia bromoides** (Linnaeus) Gray [*Festuca dertonensis* (Allioni) Ascherson & Graebner]. SQUIRREL TAIL FESCUE, BROME FESCUE (p. 220). *HABIT*: slender culmed annual herbs ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: very narrowly linear, flat or involute, up to 15 cm. long and about .5 to 2.5 mm. wide. *INFLORESCENCE*: an upwardly contracted panicle about 2 to 15 cm. long. *SPIKELETS*: about 5 to 10 mm. long and with four to seven lemmas, the lower glume is about 3.5 to 5 mm. long and the upper glume is about 4.5 to 7 mm. long. *LEMMA*: about 5.5 to 8 mm. long and terminated with a slender awn about 3 to 12 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, mostly in exposed areas with poor or compacted soils. *DISTRIBUTION*: a common weed nearly throughout the temperate regions of the world; native to Eurasia. ⊛March-May.

Vulpia microstachys (Nuttall) Bentham [*Festuca m.* Nuttall]. SMALL-SPIKED FESCUE (p. 220). *HABIT*: annual herbs with slender culms ranging from about 2 to 5 dm. (4-20") tall. *BLADES*: generally remote and about 2 to 14 cm. long, very narrowly linear (about 1 or 2 mm. wide), and flat or upwardly folded. *INFLORESCENCE*: an open panicle about 2 to 24 cm. long; the lower branches are generally remote and spreading to reflexed. *SPIKELETS*: about 6 to 10 mm. long and with one to six lemmas, the lower glume is about 2 to 5.5 mm. long and the upper glume is about 3.5 to 7.5 mm. long. *LEMMA*: about 4 to 9 mm. long, narrowly lanceolate, and terminating with a slender awn about 4 to 12 mm. long. *OCCURRENCE*: widely scattered and locally common in the Tassajara region, mostly in openings in chaparral or grassy areas that are transitional between chaparral and woodlands. *DISTRIBUTION*: from Washington and Idaho to southern California. ⊛April-May.

Vulpia microstachys var. **ciliata** (Beal) Lonard & Gould [*Festuca grayi* (Abrams) Piper, *F. eastwoodae* Piper] (p. 220). *HABIT*: similar to the typical variety, except for the pubescent glumes. *OCCURRENCE*: although plants fitting the description of this variety were found only in the cemetery on the south side of the Hog's Back, it is certainly more widely scattered in the Tassajara region. *DISTRIBUTION*: from Washington to northern Baja California and Arizona. ⊛April-May.

Vulpia microstachys var. **confusa** (Piper) Lonard & Gould [*Festuca c.* Piper, *F. tracyi* Hitchcock] (p. 220). *HABIT*: similar to the typical variety, except for the pubescent glumes and glabrous lemmas. *OCCURRENCE*: although I have not seen this taxon in this region, Vern Yadon ('80a) reported it from near the junction of Tassajara Road and the road to the Chew's Ridge Lookout and MIRA Observatory. It is probably more widely scattered in this region. *DISTRIBUTION*: from Washington to southern California. ⊛April-May.

Vulpia microstachys var. **pauciflora** (Beal) Lonard & Gould [*Festuca pacifica* Piper, *F. reflexa* Buckley] (p. 220). *HABIT*: similar to the typical variety, except for the glabrous lemmas. The lower panicle branches also tend to be more strongly reflexed. *OCCURRENCE*: widespread and locally common in openings in chaparral and in transitional areas, and perhaps the overall most common variety of the species in the Tassajara region. *DISTRIBUTION*: from British Columbia and Montana to northern Baja California and Arizona. ⊛April-May.

***Vulpia myuros** (Linnaeus) Gmelin [*Festuca m.* Linnaeus]. RAT-TAIL FESCUE (p. 220). *HABIT*: annual herbs with slender culms ranging from about 2 to 6 dm. (8-24") tall. *BLADES*: about 1 to 15 cm. long, very narrowly linear (and appearing to be filiform due to strongly involute margins), and rarely more than 2 mm. wide. *INFLORESCENCE*: an upwardly contracted and often fairly dense panicle about 3 to 24 cm. long. *SPIKELETS*: about 5 to 11 mm. long and with three to seven lemmas, the lower glume is about .5 to 2 mm. long and the upper glume is about 2.5 to 5.5 mm. long. *LEMMA*: about 4.5 to 6.5 mm. long, and terminated with a slender awn about 5 to 15 mm. long. *OCCURRENCE*: one of the most common grasses in the Tassajara region, were it is widespread and locally common to abundant in open areas at lower to intermediate elevations. *DISTRIBUTION*: a common weed in temperate and subtropical regions nearly worldwide (and particularly common on the Pacific Slope of western North America); native to southern Europe and probably the Mediterranean regions of North Africa and West Asia. ⊛April-May.

***Vulpia myuros** var. **hirsuta** (Hackel) Ascherson & Graebner [*Festuca megalura* Nuttall]. FOX-TAIL FESCUE (p. 220). *HABIT*: annual herbs basically the same as that of the typical variety, except for the cilia on the upper margins of the lemmas. *OCCURRENCE*: scattered in habitats occupied by the typical species, but less common. *DISTRIBUTION*: widespread in temperate and subtropical regions, but less common than the typical species. Native to southern Europe and probably the Mediterranean regions of North Africa and West Asia. *NOTE*: according to Flora Europaea (Tutin, et. al., '64-'80), this taxa should be considered as only a formae of the typical species. ⊛April-May.

Notes on *Poaceae*.

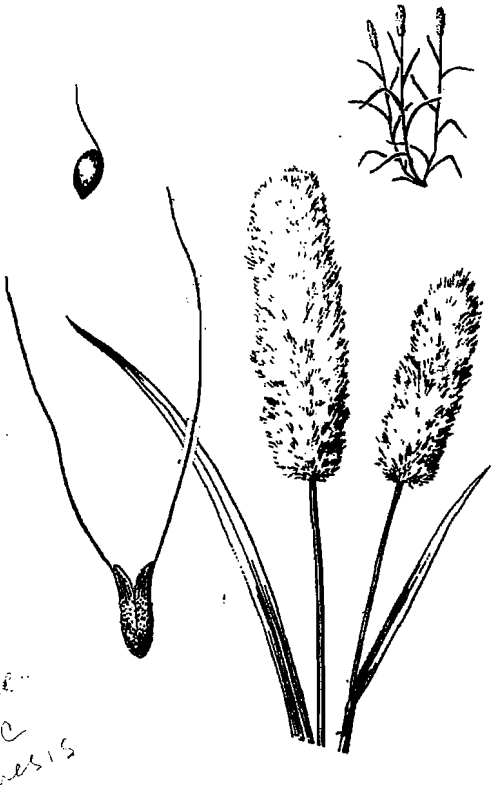
Two of A. D. E. Elmer's "Tassajara Hot Springs" specimens of June 1901 represent grass species that were not found in the Tassajara region (as defined in this text): *Trisetum canescens* (Elmer #3309 DS) and *Danthonia californica* (Elmer #3306 DS). According to the notes enclosed in envelopes pasted to the specimen sheets, *Danthonia californica* was collected in "Indian Valley" (about 5½ linear miles southwest of Tassajara Hot Springs), while *Trisetum canescens* was collected "near Black Oak Camp". It is possible that Elmer's "Black Oak Camp" is what is now known as Tan Oak Camp.

Other *Poaceae* species which are reported to occur in areas of the Santa Lucia Mountains near or relatively near the Tassajara region include: *Bromus trinii*, *Nassella cernua* [*Stipa c.*], *Scribneria bolanderi* and *Elymus elymoides* [*Sitanion hystrix*].

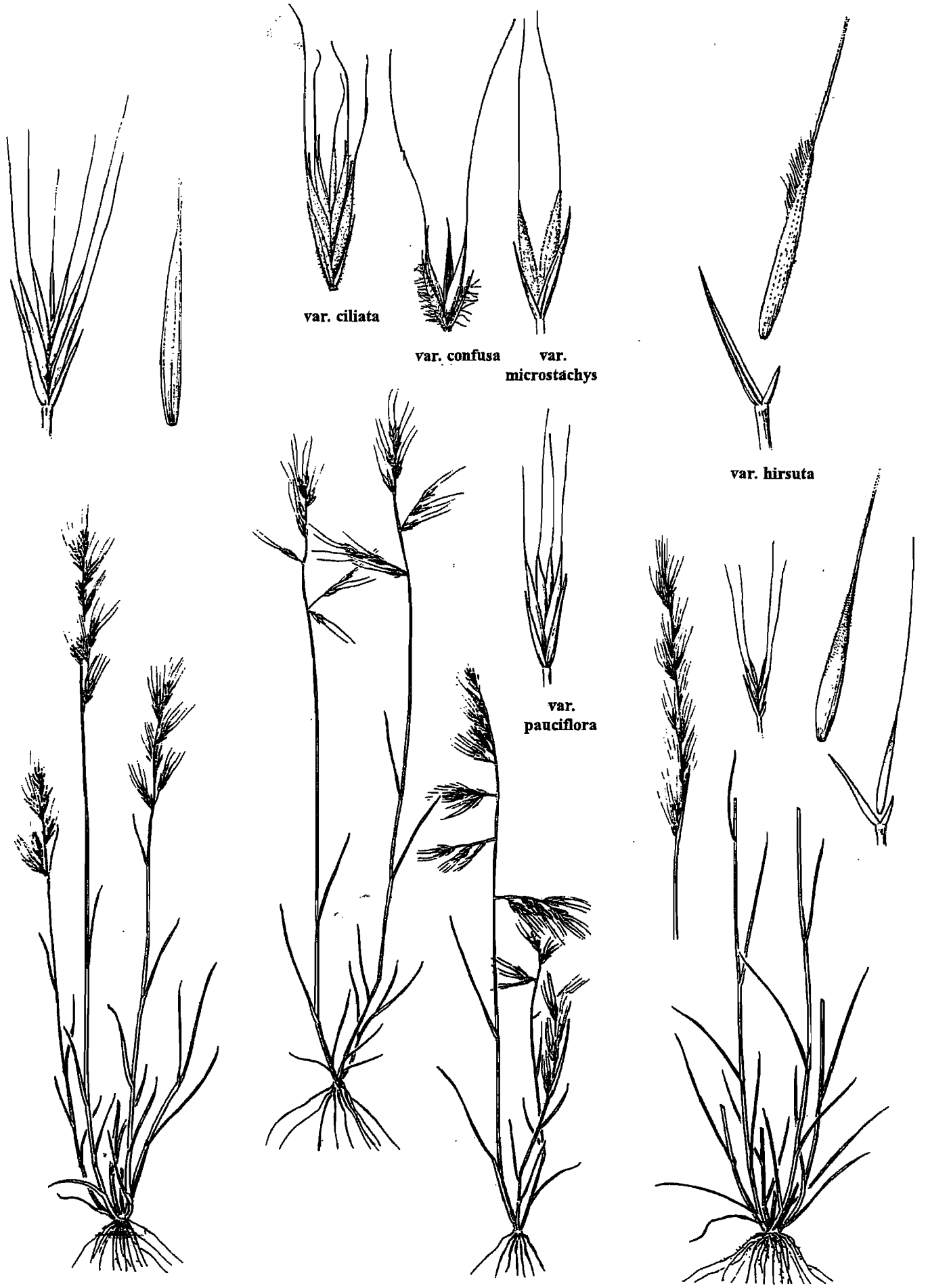
Poa howellii

Poa secunda

Polypogon interruptus



Polypogon monspeliensis



Vulpia bromoides

Vulpia microstachys

Vulpia myuros

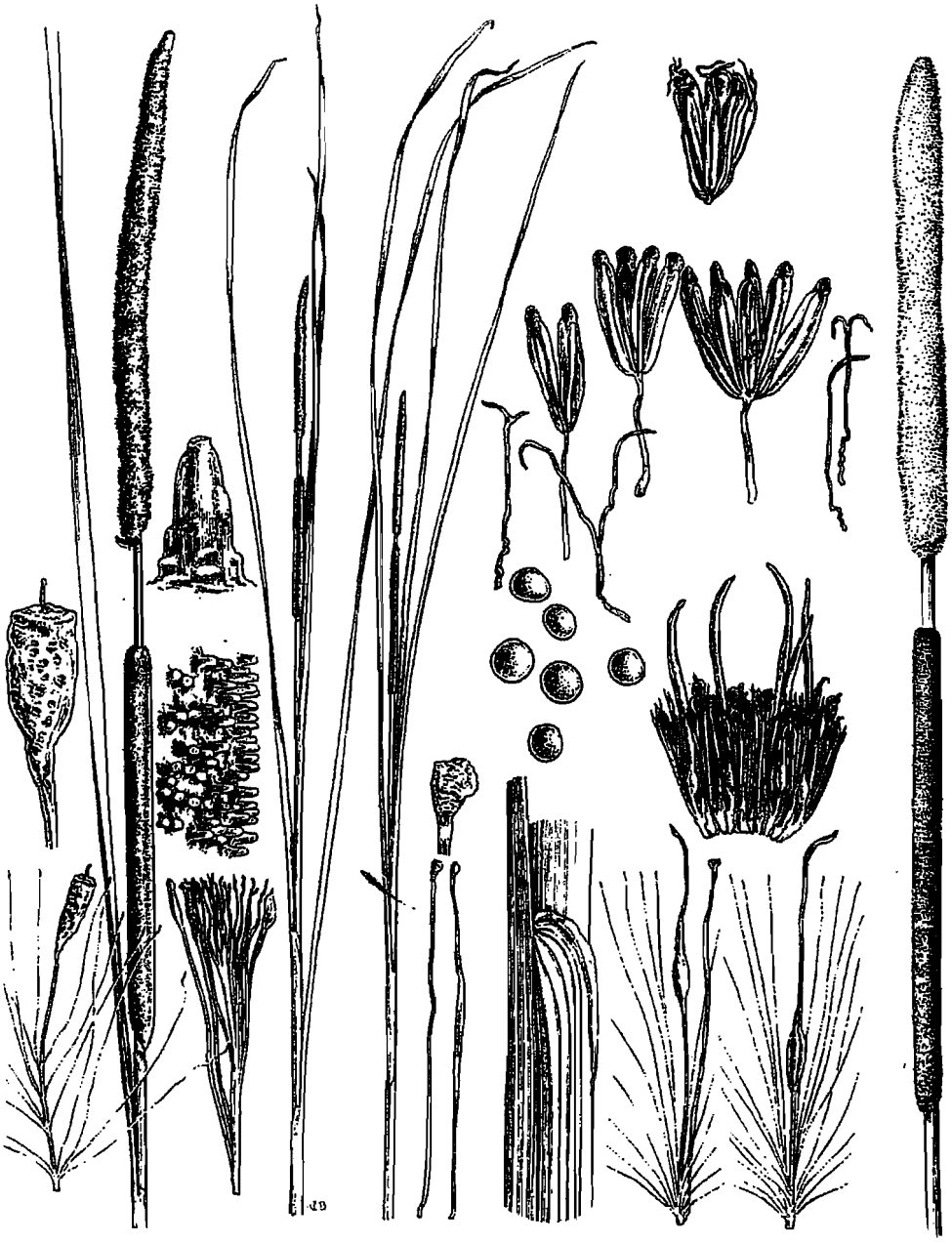
TYPHACEAE. CAT TAIL FAMILY.

Two genera and about 25 species, most of which are of wide distribution. The genus *Sparganium* (Bur-Reed) represents the subfamily *Sparganioideae* [*Sparganiaceae*], while the genus *Typha* (Cat-Tails) represents the subfamily *Typhoideae*.

TYPHA. CAT TAIL.

A nearly worldwide genus comprised of about 8 to 15 species.

Typha angustifolia Linnaeus. NARROW-LEAFED CAT TAIL, NAIL ROD (p. 221). *HABIT*: robust rhizomatic perennial herbs with stout culms ranging from about 1 to 2 m. (3.3-6.5') tall. *LEAVES*: long-linear and about as long as the culms, plano-convex with a spongy interior, and about 5 mm. wide. *INFLORESCENCE*: long and very densely flowered terminal spikes that are divided into two sections, the upper is staminate (male) and the lower is pistillate (female). *FRUIT*: seeds with a mealy endosperm, borne from stipitate ovaries that are subtended by hair-like perianth segments. *OCCURRENCE*: as typical of Cat Tails, this species is best adapted to standing or slowly flowing water. Although the swiftly flowing streams of the Tassajara region present a challenge to the survival of this species, it has, however, become fairly well established along sections of some of the smaller perennial streams (such as Blackberry Creek and Waterfall Creek, above the falls), and occasionally in protected sites along larger streams. *DISTRIBUTION*: widely scattered in temperate and tropical regions of the Americas and western Eurasia. ⊕June-July.



Typha angustifolia

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Glossary

Acaulescent. Plants without stems or true stems. Flowers are basal or on leafless scapes (stem-like peduncles) (see caulescent).

Achene. An alternate spelling of akene.

Acuminate. More or less abruptly tapering to a somewhat extended and sharply acute apex.

Acute. Tapered to a more or less sharp apex (at less than a 45 degree angle).

Akene. A dry, indehiscent, and one-seeded fruit. Also spelled as achene.

Alternate. Arranged singularly along an axis, such as leaves on a stem.

Annual. A plant that lives for less than one year.

Anther. The pollen-bearing and usually terminal part of a stamen.

Anthesis. The time of expansion of a flower; often used to describe the entire period in which the stamens are pollen emitting and/or the pistils are receptive to pollen.

Apetalous. Without petals.

Appendage. Any secondary or supplementary part attached to another formation.

Appressed. Pressed flat or nearly so against a structure (and usually parallel to the axis of the structure), such as the hairs on a leaf, or the flowers of a raceme.

Arborescent. Tree-like in size and/or habit of growth.

Articulate. Here used to describe a point where natural separation occurs (see disarticulating).

Ascending. Curving or angled upward, not strictly erect.

Asymmetric. Irregular in shape, the various parts unequal in size, shape or arrangement.

Auricle. An appendage, most commonly ear-shaped.

Awn. A terminal or sometimes lateral bristle, such as on the lemmas and/or glumes of many grasses.

Axes. The plural of axis.

Axil. The upper angle of a juncture, such as stem and branch, or a leaf and stem, branch or branchlet.

Axillary: pertaining to an axil, or to formations occurring at or from an axil.

Axis. A real or imaginary line passing along the length and direction of a stem or branch, or through the center of a formation, such as a leaf.

Banner. The upper (and usually largest) petal of most members of *Fabaceae* (Pea Family).

Basal. Produced from or pertaining to the base (of either an entire plant or a part of a plant). In this text, the term almost exclusively pertains to the lower-most leaves of a plant.

Beak. In this text used only to describe a narrowed and usually elongated appendage terminating akenes, or other types of fruits or seeds.

Berry. A juicy or fleshy and indehiscent fruit, usually with two or more seeds that are not stone-like (see drupe & pome).

Biennial. A plant that lives through two growing seasons, often flowering only in the second season.

Bifid. Two-cleft to about the middle.

Bilabiate. A tubular corolla with two lips that are unequal in size or shape, such as in the flowers of *Scrophulariaceae* or *Lamiaceae*.

Bipinnate. Twice pinnate, such as a leaf that is pinnately parted into leaflets or segments that are again pinnately parted or lobed (see pinnate).

Bipinnatifid. Twice pinnately cleft (see pinnate).

Biternate. Divided into three divisions which are again divided into three divisions (see ternate).

Blade. The expanded part of a leaf or petal; in grasses, the free part of a leaf, above the sheath.

Bract. A much reduced or rudimentary leaf or scale, often subtending flowers or flower clusters.

Bractlet. A secondary bract produced on rather than subtending a pedicel. Often sepal-like.

Bud. An immature and unopened flower, or an immature leaf or stem.

Bulb. An underground stem surrounded by fleshy leaf bases, such as an onion.

Bunch-grass. A grass producing a tuft of basal leaves.

Caducous. Falling off early or prematurely, such as sepals that fall before the anthesis of the flower.

Calyx. The outer and usually green part of flower, comprised of a whorl of segments or lobes (sepals), or united and entire, or lobed only at the apex. **Calyces**: the plural.

Campanulate. More or less bell-shaped.

Canescent. Covered with fine grayish-white hair.

Capillary. Exceedingly slender or hair-like.

Capitate. Head-like, usually pertaining to a dense, terminal, and more or less roundish flower cluster.

Capsule. A dry and usually many-seeded fruit comprised of more than one carpel, and irregularly dehiscent or dehiscent by slits or pores.

Carpel. A simple or compound pistil.

Caryopsis. The fruit (grain) of grasses.

Catkin. A scaly, deciduous, and unisexual floral spike, such as in *Quercus* or *Salix*.

Caudex. A sometimes woody, more or less vertical, and underground or exposed base of an herbaceous perennial.

Caulescent. Pertaining to plants with true and usually leafy stems (see acaulescent).

Cauline. Pertaining to or produced on a stem, such as cauline leaves (as opposed to basal leaves).

Cell. In this text pertaining to a cavity in a ovary.

Cespitose. Having a densely tufted or cushion-like habit of growth.

Chaff. Thin and dry scales or bracts. In *Asteraceae* pertaining to the inner bracts of a receptacle.

Chamber. In this text pertaining to a cavity in a ovary.

Chaparral. A more or less dense plant community comprised of evergreen and sclerophyllous shrubs that are adapted to a Mediterranean climate. The original Spanish name, *chaparro*, means a thicket of shrub-oaks.

Chartaceous. Paper-like in texture.

Ciliate. Having fringe-like hairs on a margin.

Cismontane. West of the crest of the Sierra Nevada and the axis of the higher mountains of southern California. Roughly the same as the California Floristic Province.

Clavate. Narrow at the base and gradually widening upwards, like the shape of a club.

Claw. A narrow and petiole-like base of a petal.

Cleistogamous. Applied to small and bud-like flowers that do not open and are self pollinated.

Coma. A tuft of hair or fibers, particularly on seeds (see pappus). **Comose**: having a coma.

Cone. A reproductive structure comprised of an axis and scales, the scales woody (as in alder and coniferous trees) or not (as in horsetails).

Connate. A union of like structures.

Cordate. Shaped like an upside-down valentine heart, the cleft at the point of attachment.

Corm. A thick, generally roundish and bulb-like fleshy tuber.

Corolla. The usually colorful and delicately textured inner perianth of a flower, which may be partly to completely united or divided into distinct petals (see petal).

Corymb. A racemose inflorescence with a more or less flat-topped or convex crown, with the outer (lower) pedicels longer and with flowers that typically open earlier.
Corymbose: produced in corymbs.
Cotyledon. The one or two leaf-like and often food supplying structures of a germinating seed.
Crenate. A margin with rounded or scalloped teeth.
Crenulate: the diminutive of crenate.
Crisped. A margin that is irregularly wavy or curled (contorted) perpendicular to the plane of the blade (wavy up and down as opposed to in and out).
Culm. The name applied to the hollow or pithy stems of grasses and similar plants.
Cuneate. Wedge-shaped, gradually widening from the point of attachment.
Cyme. An inflorescence or flower cluster with the terminal or central flowers blooming first.
Cymose: comprised of or pertaining to cymes.

Deciduous. Falling off seasonally or in maturity, such as leaves in autumn, petals after anthesis, ripened fruits, etc.
Decompound. Several times divided.
Decumbent. Laying more or less flat on the ground, but turning upward towards the apex (see ascending).
Decurrent. A sessile leaf in which the base is fused to and extends down the sides of a stem.
Deflexed. Turned downward or backward.
Dehiscent. Opening irregularly or by slits or valves to discharge the contents, such as the manner in which a capsule releases its seeds (see indehiscent).
Deltate, Deltoid. More or less broadly triangular, equilateral, and with the basal corners generally rounded.
Dentate. A margin with sharp teeth directed outward (as opposed to forward or backward). Denticulate: the diminutive.
Depauperate. Stunted or dwarfed in habit of growth, starved.
Dichotomous. Two-forked or branched. Often applied to an inflorescence that is repeatedly two-branched.
Dicot, Dicotyledon= Dicotyledoneae.
Dicotyledoneae. The larger class of flowering plants, in which the seeds are with 2 cotyledons at germination, the leaves are typically with a pinnate or palmate vein structure, the wood of shrubs or trees develops growth rings, and the outer flower parts (calyces & corollas), if present, are generally lobed or divided in 4's, 5's, or more.
Dioecious. Plant species in which individual plants produce either staminate or pistillate flowers, but never both, i.e., a heterosexual plant (see monoecious and perfect).
Diploid. Having a maternal and paternal set of chromosomes; $2n$ (see haploid, polyploid and tetraploid).
Disarticulating. Separating at a point of demarcation in maturity, such as at nodes or joints (see articulate).
Discoid. A composite flower head of the *Asteraceae* comprised of only tubular disk flowers.
Disk. In *Asteraceae* the central area or receptacle of a composite flower head.
Disk flower. A tubular flower of the *Asteraceae* (see ray flower & ligulate flower).
Distal, Distally. Away from the base or point of attachment; towards the apex.
Divaricate. Widely diverging.
Dorsal. The outer or back side of a structure, away from the axis (refer to ventral).
Drupe. A moist or fleshy and indehiscent fruit with one hard and usually one-seeded stone, such as a cherry (see berry & pome).
Druplet. A small drupe, often produced in aggregations, such as in a blackberry.

Ellipsoid. A three-dimensional structure in the shape of an ellipse.
Elliptic. A flat structure in the shape of an ellipse.
Emarginate. With a notched or cleft apex.
Endemic. A species in which the natural distribution is restricted to a geographical region.
Entire. Pertaining to margins that are continuous, i.e., not lobed or toothed.
Ephemeral. Of very short duration. In this text often used to describe a species that goes through prolonged periods of being very rare or absent, such as an annual "burn-species".
Erect. With a vertical habit of growth, or a formation that is vertical in relationship to an axis.
Erose. Irregularly toothed or lobed.
Evergreen. Pertaining to persistent leaves that remain green and functional throughout the year, or to plants with such leaves.
Exserted. Protruded outward or beyond other formations, such as stamens in relationship to a corolla.

Falcate. Sickle-shaped, curving to one side.
Fascicle. A cluster of flowers, leaves, stems or roots.
Fastigiate. Clustered, parallel, and erect branches.
Fertile. A reproductive part that is functional, or a plant that is reproductively functional (see sterile).
Fibrous. Comprised of or containing fibers.
Filament. The stem-like portion of a stamen which supports the anther.
Filiform. Exceeding slender; thread-like.
Fistulous. A stem or leaf that is hollow.
Flaccid. Weak or limp.
Floccose. With flocs or tufts of fine woolly hair.
Floret. The individual flowers of *Poaceae* or *Asteraceae*; a small flower of a dense cluster.
Floriferous. Producing flowers, usually applied to plants that produce many flowers.
Flower head: An inflorescence of *Asteraceae* species, in which the flowers are sessile and clustered on a common receptacle.
Foliaceous. Leaf-like, such as bracts or sepals that resemble leaves.
Follicle. A dry, one-carpeled and usually many-seeded fruit that opens from a suture on the inner (ventral) side.
Frond. The leaf of a fern, inclusive of the petiole.
Fruit. A ripened and one to many seeded pistil, such as a capsule, follicle, drupe, pome, berry, nutlet, akene, etc. A fruit may be simple, such as an acorn, or compound, such as a blackberry.
Funnelform. Funnel-shaped, i.e., tubular but narrowed at the base, and gradually expanding or spreading upward.
Fusiform. Widest at the middle and tapering to each end, like a spindle.

Galea. A hood or helmet-like upper corolla lip, such as in *Castilleja* (the paint brushes) and related genera of *Scrophulariaceae*.
Gibbous. Swollen to one side, such as a gibbous moon.
Glabrous. Without hairs; bald.
Gland. A sunken or raised formation on a surface, or the tip of a hair, that secretes a usually sticky fluid.
Glaucus. Covered with a usually whitish or bluish and waxy or powdery substance, such as the bloom of a fruit that is easily rubbed off.
Globose. Round or roundish, like a globe.
Glomerule. A terminal and compact flower cluster or cyme.
Glumes. The (usually) two outer bracts of a grass floret (see lemma, palea & spikelet).

Glutinous. With a gluey substance.
Granular. Covered with small grains or granules; mealy.
Gregarious. Here pertaining to plants that grow in groups or colonies.

Habit. Here used to describe the general form and manner of growth of a plant, such as being woody, herbaceous, annual, perennial, a vine, a tree, erect, rounded in outline, prostrate, climbing, etc.
Habitat. A distinguishable plant community or environment, or pertaining to the type of plant community or environment that a plant species usually occurs.
Haploid. Having one set of chromosomes (see diploid, polyploid and tetraploid).
Hastate. Generally shaped like an arrowhead, with the basal points or lobes at a downward angle in relationship to the apex.
Head. A dense and often roundish cluster of sessile or nearly sessile flowers (see flower head).
Hemispheric. Shaped like half of a sphere; dome-shaped.
Herb. A non-woody plant, or at least not woody above the ground. Strictly the term applies to annual herbs or to perennial herbs that die back to the root during the dry season or in winter, but in this text it is used to describe all non-woody plants (i.e., non-woody evergreen plants).
Herbaceous. Without woody tissue; herb-like.
Herbage. Pertaining to the green parts of a plant.
Heterogamous. Producing flowers with different characteristics.
Hirsute. With rough or coarse and generally erect hairs.
Hispid. With stiff and bristly hairs.
Holotype. A specimen on which the description of a species or other taxon is based (see type and isotype).
Hyaline. Colorless to translucent or nearly transparent.
Hybrid. A cross between two taxa.
Hypanthium. A generally disk, cup or tube-like floral structure comprised of the fused bases of the calyx, corolla, and sometimes the stamens. Inferior ovaries are partly to entirely fused to a hypanthium.
Hypogynous. Produced on a receptacle below and free from the pistil, such as petals or stamens.

Imbricate. Layered in an overlapping pattern, such as shingles on a roof.
Imperfect. In botany the term is applied to a flower that has either stamens or pistils, but not both (see perfect).
Incised. Deeply cut or divided.
Incurved. Bending or curving inwards.
Indehiscent. Pertaining to a non-opening fruit, such as an akene (see dehiscent).
Indusium. A tissue or scale-like formation that partly or entirely covers the sori of many fern species.
Inferior ovary. An ovary that is partly or entirely positioned below the hypanthium (and thus the calyx, corolla and stamens), and is partly to entirely fused to the hypanthium.
Inflorescence. The flowering portion or portions of a plant, inclusive of its associated parts.
Inserted. Attached to or growing upon.
Internode. A portion of a stem that is situated between nodes.
Involucel. A secondary involucre, such as the bracts subtending a secondary umbel of a compound umbel.
Involucre. A fused or divided group of bracts subtending a flower or flower cluster, such as the phyllaries in *Asteraceae* or the disk-like formations in many *Trifolium* (clover) species.
Involute. Pertaining to margins that are turned inward (upward).
Isotype. A specimen of the type collection, but not the holotype (see type and holotype).

Joint. A node, point of attachment or point of articulation.

Keel. A dorsal ridge or crease centrally located along the axis of a formation, similar to the keel of a boat. Also the inner two and often united petals of *Fabaceae* species.

Lacerate. A margin appearing irregularly torn or cleft.
Laciniate. A leaf or margin divided into narrow lobes or segments.
Lanate. Densely covered with long woolly hairs.
Lanceolate. Lance-shaped, widest in the lower half and gradually tapering to a generally acute apex, and more abruptly tapering to the base.
Lateral. Pertaining to or positioned on or at the side.
Leaflet. An often leaf-like segment of a compound leaf.
Legume. The fruit of *Fabaceae* species, a one-celled pod from a simple pistil, with one to many seeds positioned along the ventral suture, most commonly splitting longitudinally into two halves that remain united at the base. Also a generic name for *Fabaceae* species.
Lemma. The lower and generally larger of the two bracts immediately subtending the flowers of *Poaceae* (grass) species (see glumes, palea and spikelet).
Lenticular Lens, lentil or disk-shaped.
Ligulate. Strap or tongue shaped.
Ligulate head. A flower-head of *Asteraceae* species in which all of the flowers are with ligulate corollas.
Ligulate flower. Flowers of *Asteraceae* species in which the corollas are generally strap-shaped, but narrowed at or near the base into a tube. Distinguished from a ray flower in being produced in a ligulate head (see ray flower and disk flower).
Ligule. The strap-shaped corollas of some *Asteraceae* species. Also the thin and collar-like appendage situated at the juncture of a grass blade and sheath.
Limb. The expanded and often lobed portion of a united corolla or calyx, situated above the tube or throat.
Linear. Narrow to very narrow, elongated, and generally uniform in width. More narrow than oblong.
Lyrate. Lyre-shaped, such as a pinnatifid leaf with a much larger terminal segment.

Margin. The edge of a more or less flat formation.
Membranaceous, membranous. Membrane-like, i.e., thin, pliable, and often translucent.
Midrib. The central rib or vein of a leaf or other formation.
Monocot, Monocotyledon= Monocotyledoneae.
Monocotyledoneae. The smaller class of flowering plants, in which the germinating seeds are with one cotyledon, the leaves are most typically linear and with a parallel vein structure, the trunks or branches of tree or shrub-like plants are not truly woody and do not develop growth rings, and the outer flower parts are in 1's or 2's, or arranged in one or more series of 3's. Grasses, sedges, rushes, cat tails, lilies, orchids, irises, etc.
Monoecious. A species in which pistillate and staminate flowers are produced separately, often in separate formations.
Monotypic. A taxon with only one type or representative, such as genus with only one species.
Montane. Of or pertaining to mountains.

Nectariferous. Containing or producing nectar.
Node. A joint of a stem, the juncture of a stem and a branch, or the point of insertion of a leaf.

n. The number of chromosomes of a cell.

Nut. A one-seeded fruit with a hard and indehiscent shell. In some taxa the shell is at first enclosed by a fleshy and deciduous outer casing.

Nutlet. A small nut or nut-like fruit, with an individual flower often producing more than one. Like an akene but with a thicker shell.

Obcompressed. Flattened front to back as opposed to side to side.

Obconic. Inversely conic, like a cone turned upside down.

Obcordate. Generally shaped like a valentine heart, with the point of attachment at the base and the notch at the apex (see cordate).

Oblanceolate. Inversely lanceolate, wider in the outer half and gradually tapering to the base (see lanceolate).

Oblong. Longer to much longer than wide, and equal or nearly equal in width. Broader than linear.

Obovate. Inversely ovate, much wider in the outer half and narrowing to the base (see ovate).

Obovoid. A three-dimensional formation that is obovate in outline.

Obsolete. A formation that is much reduced or absent.

Obtuse. An apex or point that is blunt or rounded.

Opposite. Located directly across from, such as leaves that are produced in pairs but on opposing sides of a node.

Orbicular. Pertaining to a flat and round or nearly formation, such as a leaf.

Oval. In botany referring a broadly elliptic formation (not an egg-shaped formation).

Ovary. The generally larger and ovule producing portion of a pistil.

Ovate. Pertaining to a flat formation (such as a leaf or petal) that is generally egg-shaped in outline, wider to much wider at the base and tapering to the apex.

Ovoid. A three-dimensional formation that is ovate in outline (i.e., egg-shaped).

Ovule. The reproductive formation or formations within an ovary. After fertilization the ovules develop into seeds.

Palate. The enlarged and/or raised central portion of the lower lip of a bilabiate corolla.

Palea. In *Asteraceae* a chaff-like scale on the receptacle. In *Poaceae* the inner or upper and usually smaller bract immediately subtending a flower (see glumes, lemma & spikelet).

Palmate, palmately Radiating from a central point, like a hand with the fingers spread. Generally applied to lobes, divisions or veins of leaves.

Panicle. A compoundly branched inflorescence. In strict usage the term applies to a compound inflorescence in which some or all of the basal or lateral flowers of any axis open before the terminal or central flowers.

Pappus. The modified calyx limbs of many *Asteraceae* species, comprised one to several series of scale, bristle or plume-like formations that are terminally positioned on an akene.

Pedicel. The stalk of an individual flower or fruit (see peduncle).

Pedicellate. Having or with a petiole, as opposed to sessile.

Peduncle. The common stalk of an inflorescence or flower cluster, or of an individual flower that is not produced in an inflorescence (see pedicel).

Pedunculate. With or having a peduncle.

Perennial. Here applied to plants that live for at least three years or three growing seasons.

Perfect. In botany the term in applied to a flower that is both staminate or pistillate, i.e., bisexual or hermaphroditic (see imperfect).

Perianth. The calyx and corolla collectively. The term is used mostly in families or genera in which the calyx and corolla are often not clearly differentiated, such as in *Liliaceae* and *Polygonaceae*.

Pericarp. The inner and fruiting wall of an ovary.

Perigynia. The plural of perigynium.

Perigynium. Here used to describe the womb or sac-like structures surrounding the akenes in *Carex*, and which at first may appear to be akenes.

Perigynous. Produced around the ovary as opposed to below it, such as stamens or petals inserted on a floral tube.

Petal. A distinct or mostly distinct segment of a corolla; usually colorful and delicately textured (see corolla).

Petiolate. With a petiole (see petiole).

Petiole. The stalk of an individual leaf.

Petiolule. The stalk of an individual leaflet.

Phyllary. An individual bract subtending a flower-head in *Asteraceae* species, collectively the phyllaries form the involucre.

Pilose. With soft and spreading hairs.

Pinae. The plural of pinna.

Pinna. A leaflet or primary leaflet of a pinnately compound leaf, most commonly used to describe the primary leaflets ferns.

Pinnate. Applied to a compound or deeply lobed leaf in which the segments are arranged in rows on opposing sides of a common axis (petiole). Also used to describe the vein structure of a leaf or other formations.

Pinnatifid. Pinnately cleft or divided.

Pinnule. The secondary leaflet or lobe of a bipinnately divided leaf, or of a leaf that is more than two times pinnately parted.

Pistil. The female reproductive structure of a flower. Pistils are typically comprised of a basal ovary, one or more styles, and one or more terminal and pollen receiving stigmas.

Pistillate. Applied to a flower possessing a pistil but without stamens (or fertile stamens).

Placenta. The ovule producing surface of an ovary.

Planoconvex. Flat on one side and convex on the other side.

Plumose. Plume-like; with fine and generally downy hairs arranged along more than one side of an axis.

Pod. A general term for a dehiscent fruit, such as the legumes of *Fabaceae* species.

Pollen. The male spores produced by an anther.

Polygamous. Applied to a plant that produces staminate, pistillate and perfect flowers.

Polyploid Having three or more sets of chromosomes (see diploid, haploid and tetraploid).

Pome. An apple or apple-like fruit of some *Rosaceae* species, i.e., an indehiscent fruit comprised of an inferior and compound ovary (core) that is surrounded by a thick (or relatively thick) and fleshy hypanthium.

Procumbent. A prostrate stem or branch, primarily applied to such a formation when it does not root at the nodes.

Prostrate. A stem, branch or leaf that lays flat or nearly flat on the ground.

Puberulent. Minutely pubescent.

Pubescent. Covered with short and soft hairs.

Raceme. An unbranched inflorescence with pedicellate flowers, with the lower (the first produced) flowers opening first. Often becoming much elongated with age.

Rachilla. A small and secondary axis; most commonly applied to the axes of the spikelets of *Poaceae* (grass) species.

Rachis. The axis of a spike, raceme, or compound leaf.

Radiate. Spreading outward from a common point.

Radiate Head. A flower-head of *Asteraceae* species, in which the central portion of the receptacle produces tubular disk flowers and marginal portion produces ligulate or ray flowers. The ray flow-

ers generally radiate outward and thus resemble petals (see discoid head and ligulate head).

Ray. A primary and radiating branch of a compound umbel. In *Asteraceae* often applied to a ray flower.

Ray flower. A flower of *Asteraceae* species that is characterized by having short tube at the base and an elongated and one-sided limb, and thus resembling a petal. Distinguished from a ligulate flower in being situated at or near the margins of a radiate head (see disk flower & ligulate flower).

Receptacle. The portion of a flower to which the various parts are attached. In *Asteraceae* species the structure to which the sessile flowers are attached.

Recurved. Gradually curved backward or downward.

Reflexed. Bent or curved downward or backward at an abrupt angle.

Relict. Applied to a plant species generally of limited and/or localized distribution that was in ancient times more widely distributed.

Reniform. Kidney-shaped.

Reticulate. With a network of veins or vein-like ridges or markings.

Retrorse. Bent backward or downward.

Retuse. A rounded apex with a shallow notch.

Revolute. Applied to a margin which is downwardly curved or rolled.

Rhizomatic. Applied to a plant that produces rhizomes.

Rhizome. An underground and generally horizontal stem with scales and buds, producing roots on the lower side and stems or leafy shoots on the upper side. Rhizomatic plants often appear to be groups of plants growing in close proximity.

Rhombic. With the general shape of a baseball diamond.

Riparian. A plant community comprised of plants that are generally restricted to wet or moist habitats, such as along perennial or mostly perennial streams, lake shores, at springs, in marshy areas, etc. Riparian woodland: a riparian habitat dominated by water-loving tree species, such as *Alnus* (alder), *Platanus* (sycamore), *Populus* (cottonwood), and *Salix* (willow).

Rosette. A radiating cluster of leaves, usually at or near ground level.

Rotate. Wheel-shaped; applied mostly to a united corolla with a short to nearly absent tube and a flat and spreading limb.

Ruderal. Weedy.

Rudiment. A much reduced and sometimes imperfectly developed formation.

Rugose. A wrinkled and thus roughened surface.

Rugulose. Minutely rugose.

Sagittate. Shaped like an arrowhead, with the basal lobes pointed downward.

Salverform. With a narrow tube and an abruptly spreading and generally flat limb.

Samara. An indehiscent winged nutlet.

Saprophyte. A plant that lives off of dead organic material. Such plants do not produce chlorophyll, and are thus not green.

Savannah. A grassland characterized by the presence of spaciously placed trees.

Scabrous. Rough to the touch due to a roughened surface or the presence of short and stiff hairs.

Scape. The leafless peduncle of an acaulescent plant.

Scarious. A non-green formation that is thin, dry, and translucent to dark colored.

Sclerophyll. Pertaining to woody plants with rather thick and/or leathery evergreen leaves.

Scorpioid. Pertaining to a raceme or racemose branch of a panicle that is ultimately coiled, at least when young.

Scree. An unstable slope comprised of an amalgamation of small rock fragments, sometimes as small as gravel.

Scurfy. Covered with small scales.

Secund. One sided, often applied to an inflorescence in which the flowers are produced on only one side of the axis.

Seed. A fertilized ovule; usually applied to such a formation when at full maturation.

Seep. A wet or moist area where underground water comes to or near the surface.

Sepal. A segment or lobe of a calyx.

Seriate. Produced in series or rows.

Serpentine. An often greenish or greenish-gray rock type commonly with a greasy, silky or soapy feel and an uneven fracture. The term is also applied to soils derived from such rocks. The composition of both the rocks and soils are characterized by being low in calcium and other nutrients, while high in magnesium, iron, and sometimes toxic metals. Many plants will not grow on serpentine, while many others are largely to entirely restricted to serpentine.

Serrate. Applied to a sharply toothed margin in which the teeth are angled towards the apex of the formation, such as the teeth of a saw.

Serrulate. Finely or minutely serrate.

Sessile. Without a stalk and thus attached directly to an axis, such as a leaf without a petiole or a flower without a pedicel.

Sheath. An often tubular formation that surrounds or partially surrounds another formation, such as the lower portion of grass leaves.

Shrub. A woody plant that is smaller than a tree and usually with two or more branches at the base (see tree and subshrub).

Silicle. A short silique, generally not more than twice as long as broad (see silique).

Silique. A narrow and many-seeded capsule of *Brassicaceae* species. The valves detach from the bottom to the top.

Simple. Comprised of only one part or axis; not divided or branched.

Sinuate. A strongly wavy margin (wavy in and out).

Sinus. The space or indentation between lobes.

Sordid. With a dull or dirty hue.

Sori. The plural or sorus.

Sorus. A cluster of sporangia on the undersurface of a fern leaf.

Spatulate. Spatula or spoon-shaped, generally elongate and roundish to broadly elliptic at the apex.

Spicate. Spike-like in form or arranged in a spike.

Spike. An elongated and unbranched inflorescence with sessile flowers, flower clusters, or spikelets. Often loosely applied to any narrow and racemose inflorescence.

Spikelet. A secondary spike. In *Poaceae* (grasses) and *Cyperaceae* (sedges and related plants) applied to the individual and one to many flowered floral structures and their associated parts.

Spine. A stiff, sharply pointed, and sometimes woody projection. Also applied to a raised or otherwise prominent axis.

Spinulose. With diminutive spines.

Sporangia. The plural of sporangium.

Sporangium. A spore producing structure of non-flowering plants (such as ferns and fern allies).

Spores. The minute and dispersing reproductive units of non-flowering plants (such as ferns and fern-allies) that are capable of producing new plants.

Stamen. The male reproductive organs of a flower, most commonly comprised of a slender filament and a terminal and pollen producing anther.

Staminate. With stamens, or pertaining to a flower (or plant) with stamens but without a pistil or a functional pistil (see pistillate).

Staminode. A sterile stamen lacking an anther.

Stellate. Star-like, applied mostly to a hair with three or more branches radiating from a common point.

Stem. The axis or axes of a plant, here used mostly to describe primary axes (secondary axes are usually referred to as branches or branchlets).

Sterile. Not reproductively functional, such as a stamen without an anther, a flower without a pistil, or a seed without an embryo.

Stigma. The pollen receiving organ(s) of a pistil. Stigmas are usually terminal and elevated on a style (see pistil, style and ovary).

Stipe. The petiole of a fern leaf or the peduncle of an ovary.

Stipitate. With a stipe or stalk.

Stipules. A pair of appendages situated at the base of a petiole. Stipules vary from being leaf-like to scale-like or gland-like.

Stolon. A prostrate or semi-prostrate (or hanging) stem (runner) that roots at the nodes and/or tip, and (usually) from which erect or generally erect stems arise. The shoots of some species can produce new plants.

Strigose. With upwardly appressed hairs that are straight and relatively stiff.

Strigulose. Minutely strigose.

Style. The narrowed portion of a pistil situated between the ovary and the stigma, which is often simple but may be cleft into two or more segments. Pistils vary from being without a style (the stigmas then sessile) to having two or more styles.

Subshrub. A perennial that is woody at or near the base, but not or only slightly woody upward; semi-shrubby, suffrutescent.

Subtend. Positioned below of and in close proximity to, such as bracts placed just below a flower.

Subulate. Awl-shaped.

Succulent. Generally thick and fleshy or juicy, such as the stems or segments of cacti or the leaves of a jade or aloe plant.

Suffrutescent. Semi-shrubby or semi-woody at the base; often used in the description of subshrubs.

Superior ovary. An ovary that is situated above the point of attachment of calyx, petals and stamens, or the hypanthium on which these formations are inserted, although the ovary may be surrounded by such formations (see inferior ovary).

Symmetrical. Here used to describe a formation in which the parts of are of equal or nearly equal size, shape and arrangement.

Talus. A sloping accumulation of generally large rock fragments.

Taproot. A more or less stout and vertical primary root sending off small lateral roots. A carrot is a good example of such a structure.

Taxa. The plural of taxon.

Taxon. Any taxonomic unit, such as an order, genus, species, variety, etc.

Tendril. Slender, coiling and grasping formations, usually terminal on a stem or leaf, which allow a vine to climb on plants or other objects.

Terminal. The upper-most or outer-most point of a structure.

Ternate. Divided into three leaflets or sections, such as the leaves in *Trifolium* (clover). If the sections are again divided into three's, the leaf is biternate, and if once again divided into three's, the leaf is triternate.

Tetraploid. Having four sets of chromosomes (see diploid, haploid and polyploid).

Throat. Here used to describe the portion of a fused corolla between the basal tube and the terminal limb, lobes or lips.

Thyrse, thyrsus. A compact and generally ovate inflorescence or flower cluster, with the main axis indeterminate, while the secondary axes are cymose.

Tomentose. Densely covered with short, soft, and interwoven woolly hairs.

Tooth. Here used to describe any small marginal lobe or projection.

Tortuous. Twisted, full of turns, curves or windings.

Tree. A tall or relatively tall woody plant usually with a singular trunk (see shrub).

Tripinnate. Three times pinnately divided (see pinnate).

Triternate. Three times ternately divided (see ternate).

Truncate. Abruptly ending at the apex or base, as if cut off.

Tuber. A short and thick underground stem functioning as a storage area for food and/or water, and sometimes propagating. A potato is a good example.

Tufted. Bearing a close cluster (clump) of leaves or short, leafy branches from the base. Most frequently used in the description of perennial grasses and sedges, but sometimes in the description of low shrubs, subshrubs, or perennial herbs.

Turbinate. Inversely conical, like a top.

Type. A specimen on which the description of a species or other taxon is based (see holotype and isotype).

Umbel. A commonly flat or convex flower cluster in which the pedicels arise from a common point, such as the spokes of an umbrella. Compound umbel: an umbellate inflorescence in which the peduncles (rays) diverge from a common point, and end in a simple umbel.

Undulate. Applied to a slightly to moderately wavy margin (see sinuate).

Urticle. A small and one-seeded fruit in which the seed is loosely enclosed in a balloon or bladder-like ovary wall.

Valve. One of the segments into which a dehiscent capsule or legume separates.

Vascular plant. A plant which has a system of veins that transport a fluid comprised of water and dissolved minerals. Vascular plants include the ferns and related plants (fern allies), coniferous trees, and all flowering plants. Non-vascular plants include true mosses, fungi (mushrooms and related organisms), lichen, algae, etc.

Ventral. The inner side or face of a formation (see dorsal).

Vernal. Of or pertaining to the spring season.

Versatile. An anther attached to the filament at or near the middle, and easily swaying from one side to the other.

Villous. With relatively long, soft, and wavy or shaggy hairs.

Virgate. Used to describe branches that are slender and relatively straight and erect.

Viscid. Bearing a sticky or glutinous substance.

Whorl. A ring of three or more leaves or flowers attached at the same point on a stem.

Wing. A thin and often extending border of a structure, such as on a fruit, stem, or petiole.

Wings. The two lateral petals of *Fabaceae* species, which are positioned below the singular and usually larger petal (the banner), and are often wholly or partly obscuring the inner petal(s) (the keel).

Xerophyte. Here used to describe annual herbs in which most of the growth occurs during the dry season (generally starting in May), and in which the flowering season occurs from about July through September (in some species the flowering season may extend to late fall). In strict usage the term applies to desert plants or plants that are resistant to prolonged periods of drought.

Xerophytic. Being or pertaining to a xerophyte.

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